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November 25, 2014

**VIA OVERNIGHT DELIVERY**
Hon. Robert Stein, Chairman
and Members of the Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: New Cingular Wireless PCS, LLC ("AT&T")
Petition for a Declaratory Ruling
200 Edgemark Acres, Meriden, Connecticut

Dear Chairman Stein and Members of the Council:

On behalf of New Cingular Wireless PCS, LLC (AT&T), we respectfully enclose an original and (15) fifteen copies of a Petition for a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required to add a wireless communications facility to an existing Connecticut Light & Power transmission tower at 200 Edgemark Acres, Meriden, Connecticut. The enclosed Petition is dated November 25, 2014. Also enclosed is a CD containing an electronic version of the Petition and attachments.

Accompanying the Petition please find four copies of the Structural Analysis prepared by Centek Engineering. A check payable to the "Connecticut Siting Council" in the amount of $625.00, representing the filing fee is also enclosed.

Should the Council or Staff have any questions about this matter please do not hesitate to contact me.

Very truly yours,

Daniel M. Laub

cc: Mayor Manuel A. Santos, City of Meriden
Dominick Caruso, City Planner, City of Meriden
Michele Briggs, AT&T
David Vivian, SAI
Carlos Centore, Centek
Michael Libertine, APT
Christopher B. Fisher, Esq.

C&F: 2602625.1

CONNECTICUT SITING COUNCIL

| | | |
|---|---|---|
| PETITION OF NEW CINGULAR WIRELESS PCS, LLC ("AT&T") TO THE CONNECTICUT SITING COUNCIL FOR A DECLARATORY RULING THAT NO CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS REQUIRED FOR A PROPOSED INSTALLATION OF A WIRELESS TELECOMMUNICATIONS FACILITY ON AN EXISTING CL&P STRUCTURE LOCATED AT 200 EDGEMARK ACRES, MERIDEN, CONNECTICUT | ) | PETITION NO. _____<br>NOVEMBER 25, 2014 |

# PETITION FOR DECLARATORY RULING TO INSTALL A WIRELESS TELECOMMUNICATIONS FACILITY ON A CL&P TRANSMISSION TOWER #783 200 EDGEMARK ACRES, MERIDEN, CONNECTICUT

## I. Introduction

New Cingular Wireless PCS, LLC ("AT&T"), the "Petitioner", hereby petitions the Connecticut Siting Council ("Council") pursuant to Sections 16-50j-38 and 16-50j-39 of the Regulations of Connecticut State Agencies ("R.C.S.A.") for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need ("Certificate") is required pursuant to Section 16-50k of the Connecticut General Statutes ("C.G.S.") to add a wireless telecommunications facility to an existing Connecticut Light & Power ("CL&P") transmission tower structure #783 and located at 200 Edgemark Acres, Meriden, Connecticut (the "Site"). As set forth herein, but for a modest 12' tower extension, AT&T's collocation would satisfy all the other criteria for an exempt modification under

R.C.S.A. Section 16-50j-72 and tower sharing pursuant to Section 16-50aa of the Connecticut General Statutes.

## II. Existing Facility

The existing facility, CL&P structure #783, is located in the Town of Meriden and is part of a transmission line that runs northwest to Route 72 and beyond. Structure #783 is approximately 80 feet tall and is located in an existing CL&P easement. The underlying property is owned by Martorelli Realty Company.[1] The nearest municipal boundary is the Town of Cheshire located approximately 3,200' to the west of the existing CL&P structure. Other properties in the area include a residential uses and educational uses including H.C. Wilcox Technical High School and O.H. Platt High School.

## III. Proposed AT&T Installation

AT&T is licensed by the Federal Communications Commission ("FCC") to provide wireless services in this area of the State of Connecticut. AT&T proposes to install an antenna support structure to the existing 80' tall transmission pole, which will extend approximately 12' above the existing transmission pole. The extension would be able to support up to 12 panel antennas (9 antennas are currently proposed), along with 18 tower mounted amplifiers ("TMAs") at a centerline height of approximately 88' above grade level ("AGL"). A 12' x 24' equipment shelter with a pitched roof and clapboard siding will be placed at the base of the existing structure on a concrete foundation. A segmental retaining wall, approximately 24' by 34' is required to adequately support the equipment shelter to accommodate the grade of the property near the CL&P structure. Provisions for emergency backup power include a 50kW diesel fueled generator to be located inside the equipment shelter on the concrete foundation. The equipment shelter will be enclosed by a 6' tall chain link fence with privacy slats. Access to AT&T's proposed collocated facility is proposed from Edgemark Acres via an easement over the

[1] Documentation confirming AT&T's authority to file this petition from CL&P and the underlying property owner are included in Attachment H.

existing gravel driveway that currently serves the subject property. A small portion of the beginning of the gravel access driveway is on the subject property, but not within the CL&P easement. Utilities are proposed to extend underground from Edgemark Acres via the same utility/access easement on the underlying property to the facility.

Included as Attachment A are detailed construction drawings prepared by Centek Engineering, last revised November 20, 2014 which include an abutters map, topographic details, plans, elevations, site details, site utility plans and other aspects of proposed facility. Annexed hereto as Attachment B is a Structural Analysis report last revised October 6, 2014, also prepared by Centek Engineering, concluding that the existing utility pole and foundation with proposed reinforcements outlined therein can support AT&T's proposed facility.[2]

## IV. The Proposed Facility Will Not Have a Substantial Adverse Environmental Effect

### A. Minimal Physical Impact

A comparison of existing and proposed conditions reveals no substantial adverse environmental impacts associated with modifications to CL&P's transmission structure and AT&T's Facility. The new antenna mount and antennas will be added to the existing structure. The equipment compound will be constructed in an area already cleared in the CL&P right-of-way at the base of the pole. No tree clearing is required. No wetlands will be impacted. Grading and construction of a retaining wall is required for the proposed equipment area, which includes storm water design features. All erosion and sediment control measures will be installed in accordance with the "Connecticut Guidelines for Soil Erosion and Sediment Control" and amendments, as published by the Connecticut Council on Soil and Water Conservation. As

[2] Please note that due to its large size, the full structural report with calculations is being bulk filed along with this Petition.

such, AT&T respectfully submits that there are no significant environmental impacts associated with the proposed clearing and construction.

### B. Compliance with MPE Limits

The operation of AT&T's antennas will not increase the total radio frequency electromagnetic power density at the site to a level at or above applicable standards. A power density report is included in Attachment C. The total radio frequency power density will be well within standards adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and the MPE limits established by the Federal Communications Commission.

### C. Visibility

As demonstrated in the visual materials included in Attachment D, the proposed AT&T installation will have a *de minimus* visual impact on the surrounding area which already has existing views of the transmission tower. The installation requires no FAA lighting or marking as per the TOWAIR and FAA report included in Attachment E. Additionally, AT&T's consultants determined as part of the field review for this project that there were no quantitative changes in areas of visibility and that AT&T's proposed installation would only be visible from areas that already have views of the CL&P towers. The attached visual materials demonstrate that the incremental change in height does not substantially change the existing viewshed, particularly considering that there are other adjacent CL&P structures that are taller and at higher elevations. As such, AT&T respectfully submits that the visibility of the CL&P transmission structure with AT&T's extension is neither significant nor adverse for purposes of the Council's regulatory considerations in ruling on this petition for a declaratory ruling.

## V. Public Need

Annexed hereto in Attachment F are Radio Frequency plots depicting existing and planned coverage from the proposed facility at an antenna

centerline height of 88' AGL for AT&T's 4G LTE network in this area of the State depicting existing and proposed coverage in the 1900MHz and 700MHz spectrum bands. AT&T currently has gaps in reliable service in this area of the state and the proposed facility is needed to fill some of these existing coverage gaps within AT&T's network. As such, while the Council does not have to find a public need for the facility as part of a ruling on this Petition, it is respectfully submitted that the enclosed demonstrates the purpose for the installation of the proposed facility. This project is further consistent with state policy to avoid the proliferation of towers.

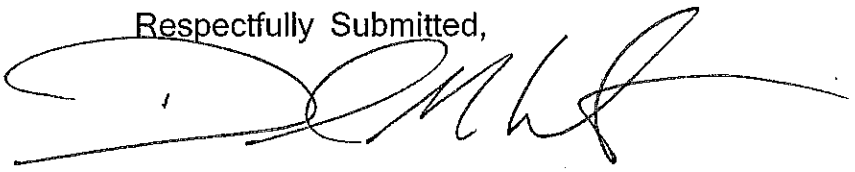
## VI. Notice

Pursuant to R.C.S.A. Section 16-50j-40(a), notice of AT&T's intent to file this petition was sent to each person appearing of record as an owner of property that abuts the site, as well as the appropriate municipal officials and government agencies as listed in Section 16-50e of the C.G.S. Certification of such notice, a copy of the notice and the list of property owners and municipal officials and government agencies to whom the notice was sent are included in Attachment G.

## VII. Conclusion

As set forth above, the proposed AT&T wireless facility and associated ground equipment are wholly consistent with legislative findings outlined in Section 16-50g and 16-50aa of the General Statutes of Connecticut that seek to avoid the unnecessary proliferation of towers in the State. Further, there are no known adverse environmental effects associated with the project. Therefore and for all the foregoing reasons, AT&T petitions the Connecticut Siting Council for a determination that the proposed wireless telecommunications facility does not require a Certificate of Environmental Compatibility and Public Need and that the Council issue an order approving same.

Respectfully Submitted,



Daniel M. Laub
On behalf of the Petitioner AT&T

cc: Mayor Manuel A. Santos, City of Meriden
Dominick Caruso, City Planner, City of Meriden
Michele Briggs, AT&T
David Vivian, SAI
Carlos Centore, Centek
Michael Libertine, APT
Christopher B. Fisher, Esq.

# ATTACHMENT A

# WIRELESS COMMUNICATIONS FACILITY

# CT2117
# MERIDEN
# CL&P UTILITY STRUCTURE NO. 783
# 200 EDGEMARK ACRES
# MERIDEN, CT 06451

## GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.

   LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S
9. OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

## SITE DIRECTIONS

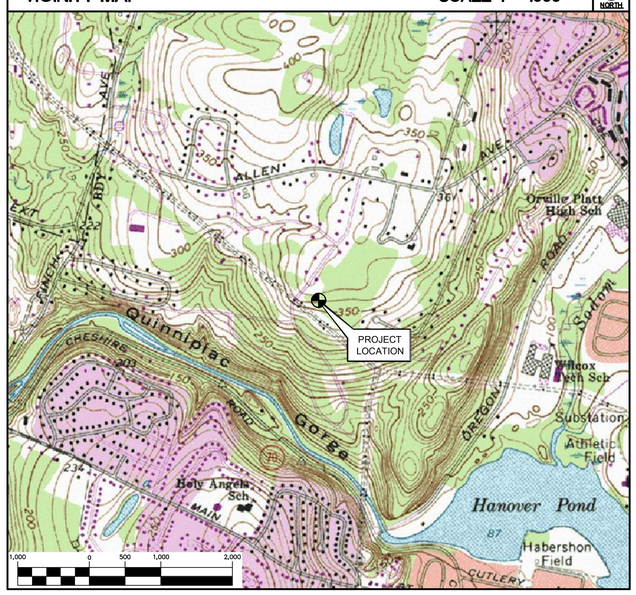
**FROM:** 500 ENTERPRISE DRIVE, ROCKY HILL, CT **TO:** 200 EDGEMARK ACRES, MERIDEN, CT

| | |
|---|---|
| 1. HEAD NORTHEAST ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD | 0.3 MI |
| 2. TURN LEFT ONTO CAPITOL BLVD | 0.3 MI |
| 3. TURN LEFT ONTO WEST ST | 0.3 MI |
| 4. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN | 0.3 MI |
| 5. MERGE ONTO I-91 S | 8.8 MI |
| 6. TAKE EXIT 18 FOR I-691 W TOWARD MERIDEN/WATERBURY | 0.2 MI |
| 7. EXIT 18 TURNS SLIGHTLY RIGHT AND BECOMES I-691 W | 2.2 MI |
| 8. TAKE EXIT 6 FOR LEWIS AVE TOWARD CT-71 | 0.2 MI |
| 9. TURN RIGHT ONTO LEWIS AVE | 0.8 MI |
| 10. TURN RIGHT ONTO W MAIN ST | 0.8 MI |
| 11. SLIGHT LEFT ONTO JOHNSON AVE | 417 FT |
| 12. TAKE THE 1ST LEFT ONTO ALLEN AVE | 0.9 MI |
| 13. TURN LEFT ONTO EDGEMARK ACRES, AND THE DESTINATION WILL BE ON THE LEFT | 0.4 MI |

## VICINITY MAP

SCALE: 1" = 1000'

NORTH




## PROJECT SUMMARY

1. THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

- INSTALLATION OF A PREFABRICATED 11'-6"x24'-0" EQUIPMENT SHELTER WITH SHELTER HOUSED 50KW DIESEL FUELED EMERGENCY POWER GENERATOR ON A CONCRETE FOUNDATION.
- A TOTAL OF NINE (9) DIRECTIONAL PANEL ANTENNAS ARE TO BE MOUNTED TO A ANTENNA MAST ATTACHED TO THE EXISTING ±80.1' TALL CL&P STRUCTURE #783 AT A CENTERLINE ELEVATION OF ±88' ABOVE THE EXISTING TOWER BASE PLATE.

2. POWER & TELCO UTILITIES WILL BE ROUTED UNDERGROUND FROM THE EXISTING UTILITY DEMARCS TO THE PROPOSED EQUIPMENT SHELTER. ALL UTILITY WORK AND ROUTING TO BE COORDINATED AND APPROVED BY THE LOCAL UTILITY COMPANIES AND LAND OWNER.

## PROJECT INFORMATION

| | |
|---|---|
| AT&T SITE NUMBER: | CT2117 |
| AT&T SITE NAME: | MERIDEN |
| SITE ADDRESS: | CL&P STRUCTURE NO. 783<br>200 EDGEMARK ACRES<br>MERIDEN, CT 06451 |
| LESSEE/APPLICANT: | AT&T MOBILITY<br>500 ENTERPRISE DRIVE, SUITE 3A<br>ROCKY HILL, CT 06067 |
| ENGINEER: | CENTEK ENGINEERING, INC.<br>63-2 NORTH BRANFORD RD.<br>BRANFORD, CT. 06405 |
| PROJECT COORDINATES: | LATITUDE: 41°-31'-51.713"N<br>LONGITUDE: 72°-50'-33.622"W<br>GROUND ELEVATION: ±360.0' A.M.S.L.<br>COORDINATES AND GROUND ELEVATION BASED ON FAA 1-A SURVEY CERTIFICATION AS PREPARED BY MARTINEZ COUCH AND ASSOCIATES, DATED JUNE 27, 2014. |

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| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
| 1 | 11/20/14 | HMR | CFC | CONSTRUCTION - ISSUED FOR CLIENT REVIEW |
| 0 | 11/10/14 | HMR | CFC | CONSTRUCTION |

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications


CENTEK engineering
Centered on Solutions℠
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Branford, CT 06405
www.CentekEng.com


AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

**MERIDEN**

**SITE NUMBER: CT2117**

**200 EDGEMARK ACRES**
**MERIDEN, CT 06451**

DATE: 11/03/14
SCALE: AS NOTED
JOB NO. 13305.000

TITLE SHEET

**T-1**

Sheet No. 1 of 17

# NOTES AND SPECIFICATIONS

## DESIGN BASIS:

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

2. TIA/EIA-222-F-1996, ASCE MANUAL NO. 72 – "DESIGN OF STEEL TRANSMISSION POLE STRUCTURES SECOND EDITION", NESC C2-2007 AND NORTHEAST UTILITIES DESIGN CRITERIA.

3. DESIGN CRITERIA

   WIND LOAD: (POWER MOUNT)
   BASIC WIND SPEED (V) =85 MPH (FASTEST MILE); BASED ON TIA/EIA-222F AND NU MAST DESIGN CRITERIA EXCEPTION 1.

   WIND LOAD: (UTILITY POLE & FOUNDATION)
   BASIC WIND SPEED (V) =110 MPH (3-SECOND GUST) BASED ON NESC C2-2007, SECTION 25 RULE 250C.

## GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.

2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.

4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.

5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.

6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.

7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.

8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.

9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES

10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.

11. THE CONTRACTOR SHALL LIMIT THE DURATION OF ANY FOUNDATION MODIFICATION WORK. THE EXISTING FOUNDATION WITHIN THE SHOWN LIMITS IS STABLE FOR WIND SPEEDS LESS THAN 50MPH WITHOUT ICE LOADING. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.

12. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

13. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.

14. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.

15. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

## SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.

2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.

4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.

5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.

8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.

11. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.

## EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.

2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAQSSES OF COMPACTOR PER LIFT.

3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

| SIEVE DESIGNATION | % PASSING |
|---|---|
| 1 ½" | 100 |
| No. 4 | 40-70 |
| No. 100 | 5-20 |
| No. 200 | 4-8 |

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

| SIEVE DESIGNATION | % PASSING |
|---|---|
| 1" | 100 |
| ¾" | 90-100 |
| ½" | 0-15 |
| ⅜" | 0-5 |

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".

6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 10" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.

7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

## FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.

2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.

3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.

4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.

5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

6. FOUNDATION WATERPROOFING AND DAMPPROOFING SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

## CONCRETE CONSTRUCTION NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:

ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.

ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION

ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.

ACI 306.1 STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING

ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

2. CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

| | |
|---|---|
| SLABS ON GRADE | 4,000 PSI |
| ALL OTHER CONCRETE | 3,000 PSI |

– PORTLAND CEMENT: ASTM C150, TYPE II, (540 LBS/CUBIC YARD)
– AGGREGATE: ASTM C33, No. 67, TYPICAL
– WATER: POTABLE WITH MAXIMUM WATER CEMENT RATIO OF .55
– SLUMP: 3" TO 4"
– ADMIXTURES: USE AIR ENTRAINING AGENT CONFORMING TO ASTM C260 WITH 4 TO 6% TOTAL AIR. USE WATER REDUCING AGENT CONFORMING TO ASTM C494, TYPE A, IN ALL CONCRETE. CALCIUM CHLORIDE MAY NOT BE USED TO ACCELERATE THE CONCRETE SETTING TIME.

3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.

4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM- A-185.

5. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".

6. CONCRETE COVER OVER REINFORCING SHALL CONFORM TO THE FOLLOWING, UNLESS OTHERWISE SHOWN:

| | |
|---|---|
| CONCRETE CAST AGAINST & PERMANENTLY EXPOSED TO EARTH | 3 INCHES |
| CONCRETE EXPOSED TO EARTH OR WEATHER: | |
| #6 THROUGH #18 BARS | 2 INCHES |
| #5 BAR, W31 OR D31 WIRE, AND SMALLER | 1-1/2 INCHES |
| CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND: | |
| #14 THROUGH #18 BARS | 1-1/2 INCHES |
| #11 BAR AND SMALLER | 3/4 INCHES |

7. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.

8. ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL STAGGERED. ADDITIONAL BARS AND SPECIAL BENDING DETAILS ARE REQUIRED AT INTERSECTING WALLS AND AT JOINTS. SUCH DETAILS SHALL COMPLY WITH ACI 315 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.

9. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.

10. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1% CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.

11. UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.

12. SLAB ON GRADE FINISHES:

EXTERIOR SLAB: NON-SLIP BROOM FINISH
INTERIOR SLAB: STEEL TROWEL FINISH

13. INSPECTION AND TESTING OF CONCRETE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, PAID BY THE OWNER, AND APPROVED BY THE ENGINEER. THE INSPECTOR SHALL OBSERVE CONDITION OF SOILS AND FORMWORK BEFORE FOOTINGS ARE PLACED, SIZE, SPACING AND LOCATION OF REINFORCEMENT, AND PLACEMENT OF CONCRETE.

14. THE TESTING COMPANY SHALL ALSO OBTAIN A MINIMUM OF THREE (3) COMPRESSIVE STRENGTH TEST SPECIMENS FOR EACH CONCRETE MIX DESIGN. ONE SPECIMEN TESTED AT 7 DAYS, ONE AT 28 DAYS, AND ONE HELD IN RESERVE FOR FUTURE TESTING, IF NEEDED.

15. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

## STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

11. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

12. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

13. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

14. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.

15. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

16. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

17. FABRICATE BEAMS WITH MILL CAMBER UP.

18. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

19. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

20. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.

21. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

## STRUCTURAL LUMBER CONSTRUCTION:

1. STRUCTURAL LUMBER USED FOR JOISTS, RAFTERS AND COLUMNS SHALL BE NO. 2 GRADE DOUGLAS FIR AND SHALL HAVE NOT LESS THAN THE FOLLOWING ALLOWABLE UNIT STRESSES, BEFORE ADJUSTMENT FOR DURATION FACTORS, BASED ON 1997 NDS SPECIFICATION:

| | |
|---|---|
| EXTREME FIBER IN BENDING | Fb 875 PSI |
| HORIZONTAL SHEAR | Fv 95 PSI |
| TENSION PARALLEL TO GRAIN | Ft = 575 PSI |
| COMPRESSION PERPENDICULAR TO GRAIN | Fc 625 PSI |
| COMPRESSION PARALLEL TO GRAIN . | Fc = 1,350 PSI |
| MODULUS OF ELASTICITY | E = 1,600,000 PSI |

2. LIGHT FRAMING LUMBER USED FOR STUDS, PARTITIONS, AND MISCELLANEOUS FRAMING SHALL NOT BE LESS THAN STANDARD GRADE AND SHALL HAVE THE FOLLOWING MINIMUM ALLOWABLE UNIT STRESSES:

| | |
|---|---|
| EXTREME FIBER IN BENDING | Fb 675 PSI |
| TENSION PARALLEL TO GRAIN | Ft = 450 PSI |
| COMPRESSION PARALLEL TO GRAIN | Fc 850 PSI |
| MODULUS OF ELASTICITY | E = 1,400,000 PSI |

3. MOISTURE CONTENT OF ALL FRAMING LUMBER WHEN DELIVERED TO THE PROJECT SITE SHALL NOT EXCEED 19%.

4. EXCEPT WHERE STRICTER PROVISIONS ARE INDICATED, 2003 INTERNATIONAL RESIDENTIAL CODE SHALL GOVERN ALL WOOD CONSTRUCTION INCLUDING, BUT NOT LIMITED TO: MATERIALS, FASTENERS (TYPE, SIZE, SPACING, EMBEDMENT), SHOP AND FIELD FABRICATION, CONNECTIONS, AND INSTALLATION.

5. NOT USED

6. NAIL PENETRATION INTO WALL STUDS AND CORNER POSTS SHALL BE AT LEAST 1 3/4 INCHES.

7. PROVIDE AND INSTALL TIMBER POSTS (6x6 OR BUILT UP 2x6 MEMBERS) AT ALL EXTERIOR CORNERS AND ANCHOR TO FOUNDATION WALLS, AND BETWEEN EACH FRAMING LEVEL TO RESIST UPLIFT FORCES. PROVIDE AND INSTALL SIMPSON HDU5-SDS2.5 (HOLD DOWN) ANCHORS WITH SSTB24 ANCHOR RODS OR EQUIVALENT AT FOUNDATION WALLS. PROVIDE AND INSTALL HDU2-SDS2.5 ANCHORS WITH SSTB16 ANCHOR RODS AND POSTS EACH SIDE OF DOOR OPENINGS GREATER THAN 4'-0" IN EXTERIOR WALLS.

8. HORIZONTAL (SLOPED) DIAPHRAGMS: THE FLOOR AND ROOF ARE DESIGNED AS DIAPHRAGMS TO RESIST LATERAL LOADS. FLOOR SHEATHIING SHALL BE 3/4 INCH THICK APA RATED STURDI-FLOOR TONGUE AND GROOVE PLYWOOD. FLOOR SHEATHING SHALL BE ATTACHED TO FLOOR JOISTS WITH CONSTRUCTION ADHESIVE AND 8D NAILS. ROOF SHEATHIING SHALL BE 5/8 INCH THICK CDX PLYWOOD. ROOF SHEATHING SHALL BE ATTACHED TO RAFTERS WITH 8D NAILS.

   MAXIMUM NAIL SPACING OF FLOOR AND ROOF SHEATHING SHALL BE 6" o.c. ALONG ALL EDGES. ALL EDGES SHALL BE SUPPORTED WITH SOLID BLOCKING. FIELD NAILING SHALL BE 12" o.c. NAIL PENETRATION INTO SUPPORTING MEMBER SHALL BE AT LEAST 1-1 /2 INCHES.

9. ALL DOUBLE TOP PLATES, RIM JOISTS, AND HEADERS IN EXTERIOR WALLS ARE USED AS DIAPHRAGM CHORD MEMBERS. SPLICES IN DOUBLE TOP PLATES SHALL BE STAGGERED AND METAL STRAPS PROVIDED TO CONNECT RIM JOISTS WITH HEADER AND LINTEL BEAMS.

10. FRAMING ANCHORS AND RELATED CONNECTION HARDWARE SHALL BE FABRICATED BY SIMPSON STRONG-TIE COMPANY, INC., OR EQUAL. SUCH PRODUCTS SHALL BE PROPERLY INSTALLED WITH THE TYPE AND NUMBER OF FASTENERS SPECIFIED BY THE MANUFACTURER FOR THE INTENDED USE.

    JOIST AND BEAM HANGERS AND OTHER FRAMING ANCHORS SHALL BE SIZED FOR REACTIONS SHOWN ON THE DRAWINGS UNLESS A SPECIFIC HANGER OR FRAMING ANCHOR IS INDICATED. SUBMIT SHOP DRAWINGS INDICATING PROPOSED HANGER SIZE AND TYPE.

    CONNECTION HARDWARE AND FASTENERS SHALL BE GALVANIZED OR STAINLESS STEEL. FRAMING ANCHORS AND FASTENERS THAT ARE NOT EXPOSED TO THE WEATHER SHALL BE G90 GALVANIZED. FRAMING ANCHORS AND FASTENERS THAT ARE EXPOSED TO THE WEATHER SHALL BE STAINLESS STEEL.

11. ALL STRUCTURAL WOOD MEMBERS SHALL BE PROPERLY FIELD FABRICATED TO REQUIRED LENGTHS AND SPACING. PROVIDE SUITABLE CONNECTIONS, BEARING LENGTHS, STIFFENERS, BRIDGING, HEADERS, AND OTHER SPECIAL FRAMING AS INDICATED OR REQUIRED BY BUILDING CODE FOR COMPLETE INSTALLATION. ADDITIONAL JOISTS ARE REQUIRED AT FRAMED OPENINGS, AT CONCENTRATED LOADS, AND DIRECTLY BELOW PARTITIONS THAT ARE PARALLEL WITH JOISTS.

12. ALL FRAMING (ROOF, FLOORS, WALLS) SHALL BE PROPERLY ANCHORED TO EACH OTHER AND TO CONCRETE FOUNDATIONS AGAINST UPLIFT BY ADEQUATELY SPLICED AND NAILED ROOF AND WALL SHEATHING, BY METAL STRAPS, HURRICANE ANCHORS, OR SIMILAR CONNECTION HARDWARE.

13. PROVIDE HEAVY HEX NUTS AND WASHERS AT ALL ANCHOR BOLTS AND AT WOOD FRAME CONNECTIONS TO AVOID CRUSHING WOOD FIBERS.

14. PRESSURE TREATED LUMBER SHALL BE USED FOR FOUNDATION SILLS AND FOR ALL LUMBER EXPOSED TO THE WEATHER AND IN DIRECT CONTACT WITH CONCRETE OR MASONRY FOUNDATIONS.

15. PROVIDE SOLID BLOCKING BETWEEN ADJACENT FLOOR JOISTS AND ROOF RAFTERS, AT ALL SUPPORTS AND TOP FLANGE HANGERS, TO PREVENT MEMBER ROTATION. ALLOW SUFFICIENT CLEARANCE FOR CROSS VENTILATION AT ROOF.

16. PROVIDE SOLID BLOCKING AND/OR MINIMUM 1"x3" DIAGONAL BRIDGING AT 7 FEET ON CENTER MAXIMUM AT ALL WOOD FRAMING. IF SOLID BLOCKING IS USED, IT SHALL EXTEND THE FULL DEPTH OF THE MEMBER IT IS LATERALLY SUPPORTING, UNLESS OTHERWISE NOTD.

17. EXTERIOR WALLS AND INTERIOR LOAD-BEARING WALLS SHALL BE FRAMED WITH 2x6 STUDS SPACED AT 16 INCHES ON CENTER AND SHALL HAVE DOUBLE TOP PLATES. INTERIOR NON-LOAD-BEARING PARTITIONS SHALL BE FRAMED WITH 2x4 STUDS SPACED AT 16 INCHES ON CENTER. UNLESS OTHERWISE INDICATED, BEARING WALLS AND PARTITIONS THAT ARE PARALLEL WITH FLOOR JOISTS SHALL BE FULLY SUPPORTED BY DOUBLE JOISTS. INSTALL SOLID FULL-DEPTH BLOCKING BETWEEN JOISTS DIRECTLY BELOW BEARING WALLS AND PARTITIONS THAT ARE PERPENDICULAR WITH FLOOR JOISTS.

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
| 1 | 11/20/14 | HMR | CFC | CONSTRUCTION – ISSUED FOR CLIENT REVIEW |
| 0 | 11/10/14 | HMR | CFC | CONSTRUCTION |

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**200 EDGEMARK ACRES**
**MERIDEN, CT 06451**

| | |
|---|---|
| DATE: | 11/03/14 |
| SCALE: | AS NOTED |
| JOB NO. | 13305.000 |

NOTES AND SPECIFICATIONS

**N-1**

Sheet No. 2 of 17

## MISCELLANEOUS SITE INFORMATION

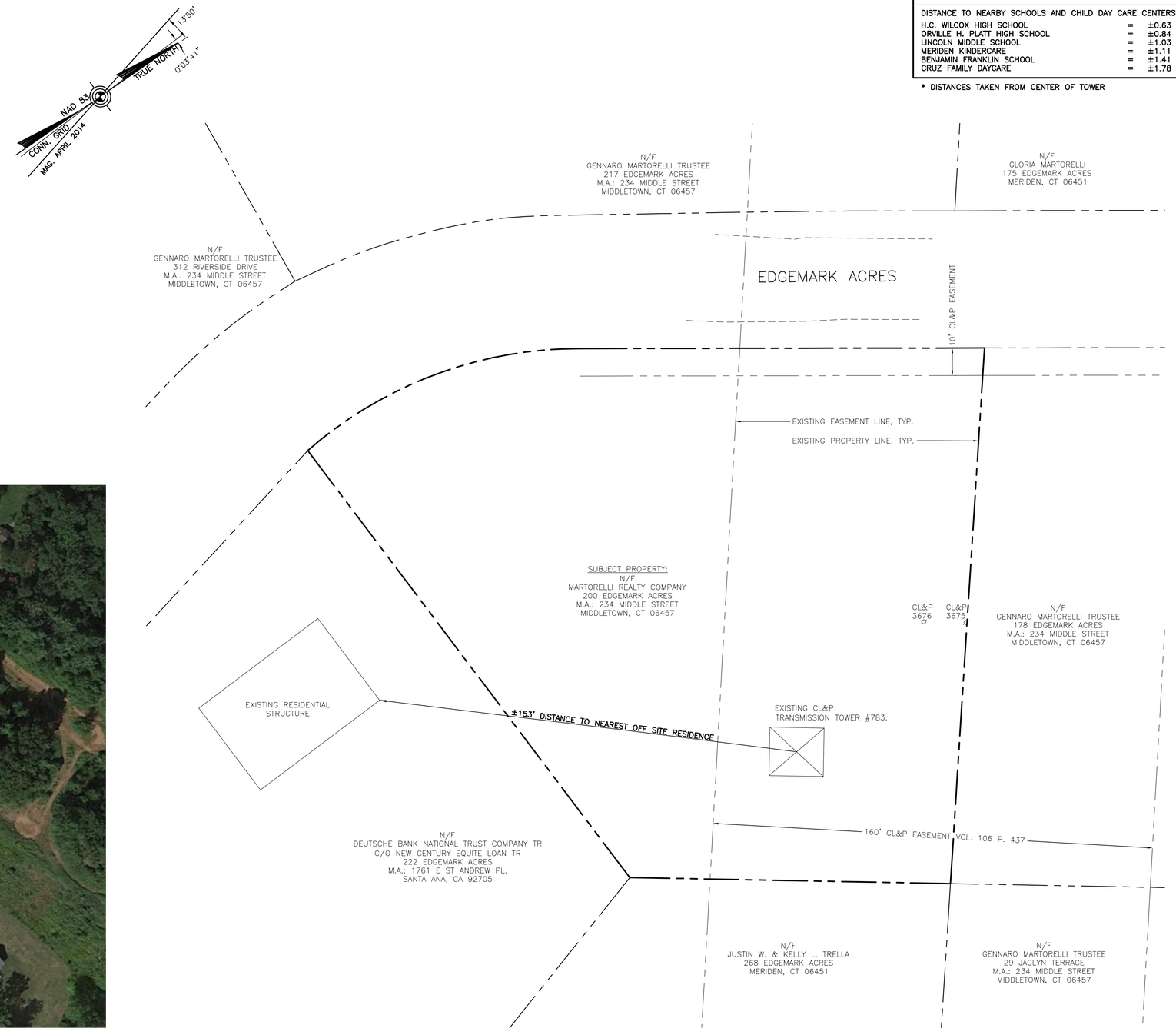
| | | |
|---|---|---|
| DISTANCE TO NEAREST OFF SITE RESIDENCE* | = | ±153' |
| NUMBER OF RESIDENTIAL STRUCTURES WITHIN 1000' OF TOWER | = | ±42 |
| DISTANCE TO NEAREST PROPERTY LINE* | = | ±47' |
| DISTANCE TO NEARBY SCHOOLS AND CHILD DAY CARE CENTERS*: | | |
| H.C. WILCOX HIGH SCHOOL | = | ±0.63 mi |
| ORVILLE H. PLATT HIGH SCHOOL | = | ±0.84 mi |
| LINCOLN MIDDLE SCHOOL | = | ±1.03 mi |
| MERIDEN KINDERCARE | = | ±1.11 mi |
| BENJAMIN FRANKLIN SCHOOL | = | ±1.41 mi |
| CRUZ FAMILY DAYCARE | = | ±1.78 mi |

* DISTANCES TAKEN FROM CENTER OF TOWER


2 C-1.0 **AERIAL PHOTO**
SCALE: 1" = 100'

APPROXIMATE NORTH

GRAPHIC SCALE
100 0 50 100 200 400
( IN FEET )
1 inch = 100 ft.




1 C-1.0 **ABUTTERS MAP**
SCALE: 1" = 20'

GRAPHIC SCALE
20 0 10 20 40 80
( IN FEET )
1 inch = 20 ft.

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
| 0 | 11/10/14 | HMR | CFC | CONSTRUCTION – ISSUED FOR CLIENT REVIEW |
| 1 | 11/20/14 | HMR | CFC | CONSTRUCTION |

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**MERIDEN, CT 06451**

DATE: 11/03/14
SCALE: AS NOTED
JOB NO. 13305.000

ABUTTERS MAP

C-1.0

Sheet No. 3 of 17

## SYMBOLS LEGEND

- PROPERTY LINE
- EASEMENT LINE
- DRIVE (EXISTING)
- 650 CONTOUR LINE
- 650 GRADING LINE
- UTILITY POLE
- MH EXISTING MANHOLE
- FENCE LINE
- PROPOSED SPOT GRADE
- CB EXISTING CATCH BASIN
- WV EXISTING WATER VALVE
- GV EXISTING GAS VALVE

## NOTES

USE OF METAL BASED TAPE MEASURES FOR PURPOSES OF TOWER AND ANTENNA HEIGHT MEASUREMENTS IS **PROHIBITED** WHEN THE HEIGHT OF THE TOWER/ANTENNA MAST IS **GREATER** THAN THE DISTANCE TO THE NEAREST POWER LINE.

| | | |
|---|---|---|
| HEIGHT OF TOWER/ANTENNA MAST (A.G.L) | = | ±93' |
| DISTANCE TO NEAREST POWER LINE | = | ±21' |

SURVEY NOTES

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THRU 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPT. 26, 1996. THE LIMITED TOPOGRAPHIC SURVEY PORTION OF THIS PLAN CONFORMS TO A VERTICAL ACCURACY OF CLASS T-2 AND IS INTENDED TO BE USED TO DEPICT A PROPOSED TELECOMMUNICATION SITE.

THE PROPERTY/BOUNDARY LINES DEPICTED HEREON ARE COMPILED FROM OTHER MAPS, DEEDS AND LIMITED FIELD SURVEY. THESE LINES ARE NOT TO BE CONSTRUED AS A BOUNDARY OPINION AND ARE SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. PROPERTY MAY BE SUBJECT TO ENCUMBRANCES, EASEMENTS, RIGHTS OF WAY AS A TITLE SEARCH REPORT MAY DISCLOSE. PLANIMETRIC FEATURES SUCH AS PARKING AREAS, PAVED DRIVE ARE COMPILED FROM OTHER MAPS AND LIMITED FIELD SURVEY.

COORDINATES REFER TO NAD 83.

VERTICAL DATUM IS BASED ON NGVD 29.

PARCEL OWNER OF RECORD: MARTORELLI REALTY CO
234 MIDDLE STREET
MIDDLETOWN, CT 06457

PARCEL AREA = 0.83± ACRES.

PARCEL IS IN R-R ZONING DISTRICT.

PARCEL ID 0627-0225-004L-0043 ON THE MERIDEN ASSESSOR'S MAP.

SUBJECT PARCEL IS NOT IN A FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP, NEW HAVEN COUNTY, CONNECTICUT PANEL 164 OF 635, MAP NUMBER 09009C0164H, MAP EFFECTIVE DATE DECEMBER 17, 2010, BY FEDERAL EMERGENCY MANAGEMENT AGENCY.

REFERENCE IS MADE TO THE FOLLOWING MAPS:

1. SUBDIVISION, ROLLING HILLS PHASE II, MERIDEN, CT, SCALE 1"=100', DATED 5-6-88, REVISED THROUGH 12-6-90. RECORDED AS MAP #5119 OF THE MERIDEN LAND RECORDS.

NOT ALL IMPROVEMENTS SHOWN.

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

A. RAFAEL MARTINEZ LLS #18833 DATE

NAD 83 CONN. GRID MAG. APRIL 2014 — TRUE NORTH — 13°50' — 0°03'41"

EDGEMARK ACRES

AT&T PAD MOUNTED TRANSFORMER AND ASSOCIATED PIPE BOLLARDS, TYP.

AT&T 20' WIDE ACCESS/UTILITY EASEMENT.

1/C-3 AT&T 20' WIDE ACCESS GATE.

1&2/C-4 AT&T 6' TALL WOOD STOCKADE FENCE, TYP.

3/C-3 AT&T GRAVEL COMPOUND SURFACE, TYP. (HATCHED AREA)

7/C-3 AT&T SEGMENTAL RETAINING WALL.

EXTENT OF REINFORCED CONCRETE MAT FOUNDATION FOR SUBJECT TOWER.

EXISTING ±80.1' TALL CL&P TRANSMISSION TOWER #783.

EXISTING SPOT ELEVATION, TYP.

10' CL&P EASEMENT

20'

EXISTING GRAVEL DRIVE

LEDGE

EXISTING GRAVEL

CB

CL&P 3676

CL&P 3675

±22' (FENCE)

±19' (RET./ WALL)

TW=363.5
BW=356.0

TW=364.0
BW=364.0

TW=363.3
BW=358.0

TW=364.0
BW=364.0

±34' (RET. WALL)

±64' (FENCE)

±24' (RET. WALL)

±41'-6" (FENCE)

±30' (FENCE)

5'

160' CL&P EASEMENT VOL. 106 P. 437

1/C-1 SITE/SITE SURVEY PLAN
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
( IN FEET )
1 inch = 10 ft.

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
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**SITE NUMBER: CT2117**
**200 EDGEMARK ACRES**
**MERIDEN, CT 06451**

DATE: 11/03/14
SCALE: AS NOTED
JOB NO. 13305.000

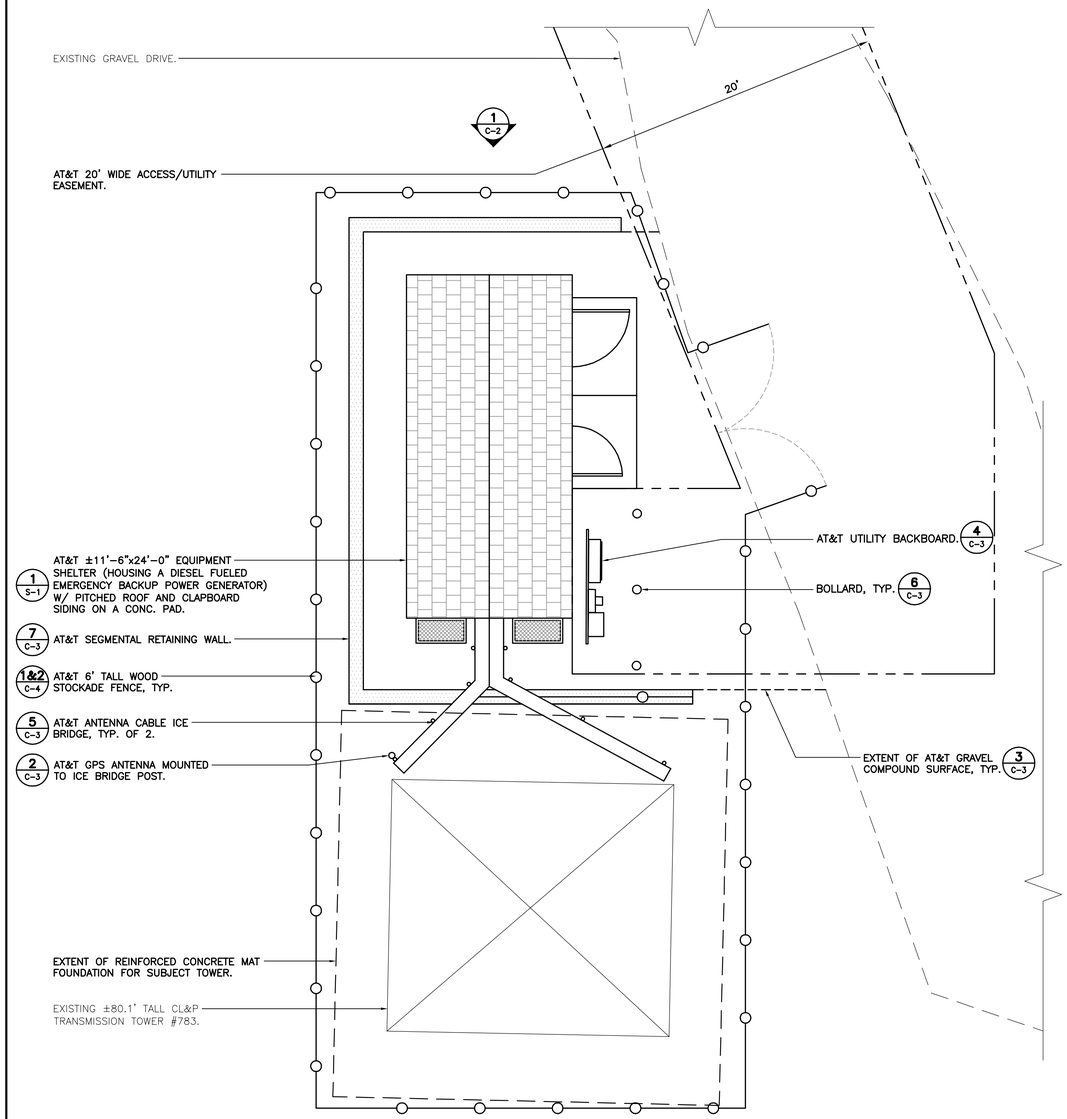
SITE/SITE SURVEY PLAN

C-1.1

Sheet No. 4 of 17

# RF EQUIPMENT TABLE

| SECTOR | PANEL ANTENNAS | | | | | FILTER | FROM TMA | | | | TMA | | FROM SHELTER | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AZIMUTH | QTY. | MAKE: MODEL | RAD CENTER (AGL) | DOWNTILT | QTY. | JUMPER QTY. | JUMPER SIZE | JUMPER LENGTH | RET QTY. | QTY. | MAKE & MODEL | COAX SIZE | COAX QTY. | COAX LENGTH |
| ALPHA | 0° | 2 | CCI: HPA-65R-BUU-H8 | 88.0' | 0°M/0°E | 0 | 20 | 1/2" Ø | 15' ± | 0 | 6 | CCI TMABPDB7823VG12A | 1-5/8" | 36 | 120'± |
| | | 1 | CCI: OPA-65R-LCUU-H8 | | | | | | | | | | | | |
| BETA | 120° | 2 | CCI: HPA-65R-BUU-H8 | 88.0' | 0°M/0°E | 0 | 20 | 1/2" Ø | 15' ± | 0 | 6 | CCI TMABPDB7823VG12A | | | 120'± |
| | | 1 | CCI: OPA-65R-LCUU-H8 | | | | | | | | | | | | |
| GAMMA | 240° | 2 | CCI: HPA-65R-BUU-H8 | 88.0' | 0°M/0°E | 0 | 20 | 1/2" Ø | 15' ± | 0 | 6 | CCI TMABPDB7823VG12A | | | 120'± |
| | | 1 | CCI: OPA-65R-LCUU-H8 | | | | | | | | | | | | |




## 2 C-2 COMPOUND PLAN

SCALE: 1" = 5'

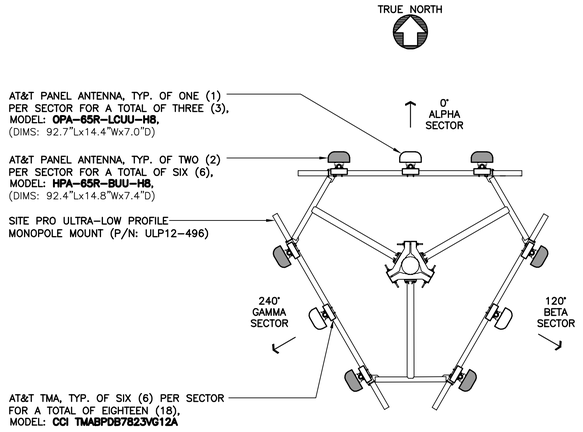
APPROXIMATE NORTH

GRAPHIC SCALE

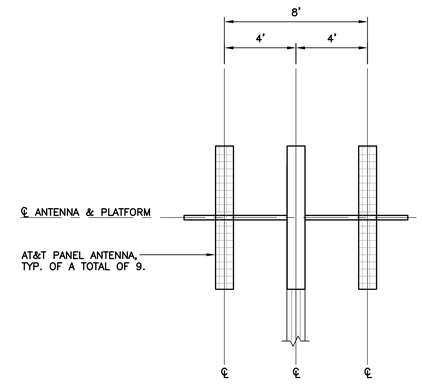
5 0 2.5 5 10 20

( IN FEET )

1 inch = 5 ft.




PLAN



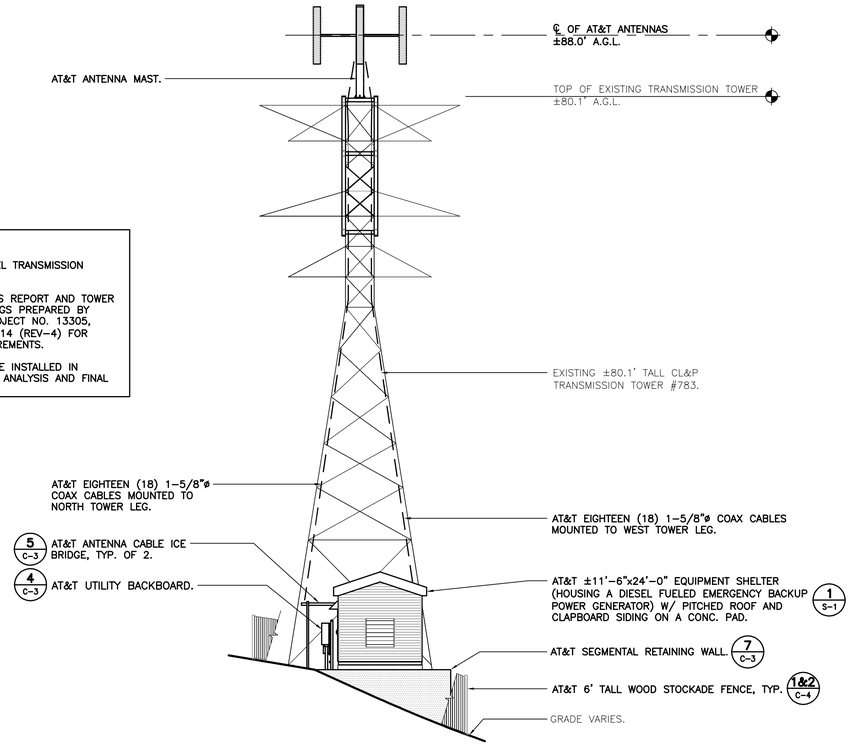

ELEVATION

## 3 C-2 ANTENNA MOUNTING CONFIGURATION DETAILS

SCALE: 1/4" = 1'

**TOWER NOTES:**

1. EXISTING 80.1' TALL CL&P STEEL TRANSMISSION STRUCTURE NO. 783.
2. REFER TO STRUCTURAL ANALYSIS REPORT AND TOWER REINFORCEMENT DESIGN DRAWINGS PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 13305, DATED 1/7/14, REVISED 10/6/14 (REV-4) FOR ADDITIONAL DETAILS AND REQUIREMENTS.
3. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS AND FINAL AT&T RF DATA SHEET.




## 1 C-2 WESTERN ELEVATION

SCALE: 1" = 10'

GRAPHIC SCALE

10 0 5 10 20 40

( IN FEET )

1 inch = 10 ft.

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|---|---|
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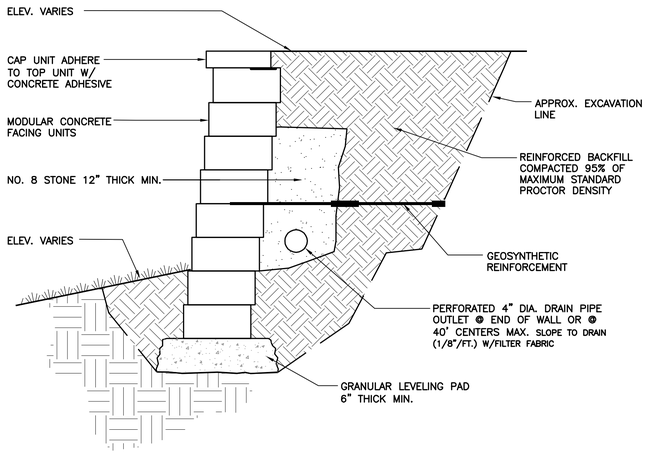
COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING DETAILS

**C-2**

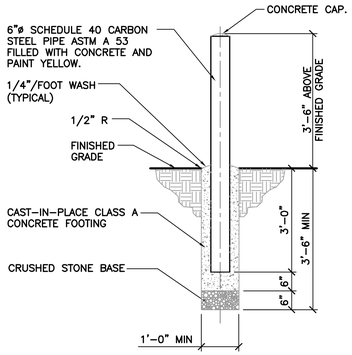
Sheet No. 5 of 17



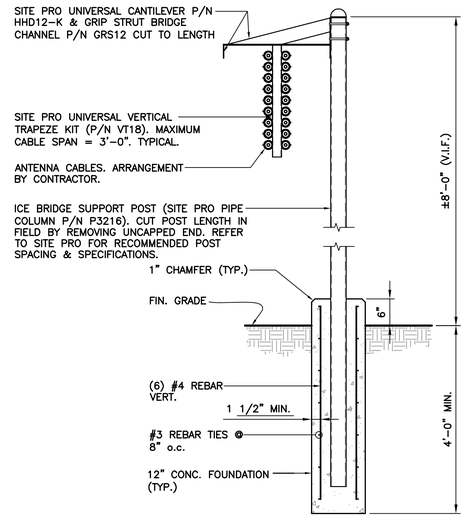

## SEGMENTAL RETAINING WALL NOTES:

1. STRIP VEGETATION AND ORGANIC SOIL FROM WALL AND GEOSYNTHETIC ALIGNMENT.
2. BENCH CUT ALL EXCAVATED SLOPES.
3. DO NOT OVER EXCAVATE UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.
4. SITE SOIL ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
5. BASE SHALL CONSIST OF COMPACTED GRAVEL, 6" THICK MIN.
6. CONTRACTOR MAY OPT FOR A LEAN CONCRETE PAD. CONCRETE PAD SHALL BE UNREINFORCED, 4" THICK.
7. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE 2 COURSES OF BLOCK".
8. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
9. NO. 8 CRUSHED STONE SHALL BE INSTALLED BEHIND THE WALL UP TO 18" FROM THE TOP OF THE WALL. CRUSHED STONE SHALL NOT EXTEND BELOW FINISHED GRADE IN FRONT OF WALL.
10. WHERE DRAIN PIPE IS USED, PROVIDE OUTLETS @ MAX. 40 FT C-C.
11. FOR UNITS TO BE EMBEDDED, COMPACT FILL IN FRONT OF UNITS AT THE SAME TIME BACKFILL BEHIND UNITS IS COMPACTED.
12. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE ENGINEER.
13. COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY. (ASTM D-698)
14. SEE SHOP DRAWINGS FOR GEOSYNTHETIC TYPE, LENGTH AND LOCATION REQUIRED.
15. GEOSYNTHETIC SHALL BE THE TYPE AND LENGTH AS SHOWN ON SHOP DRAWINGS. PULL GEOSYNTHETIC TIGHT PRIOR TO BACKFILLING.
16. GEOSYNTHETIC SHALL BE PLACED WITH STRONGEST DIRECTION PERPENDICULAR TO WALL. FOLLOW GEOSYNTHETIC MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
17. THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING SHOWING THE COMPLETE WALL SYSTEM AND ALL DETAILS BASED ON THE ACTUAL SOILS IN THE FIELD THESE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT
18. IF CONDITIONS ARE DIFFERENT THAN THOSE STATED IN THESE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR MUST CONTACT ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.
19. IF WALL LEVELING PAD REQUIRES FILL IT SHALL BE COMPACTED GRAVEL FROM BOTTOM OF EXCAVATION TO SUITABLE SOIL TO BOTTOM OF WALL.

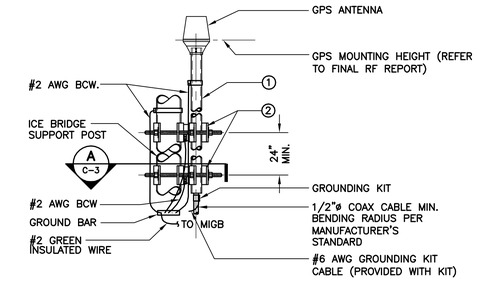
7 C-3 **SEGMENTAL RETAINING WALL DETAIL**
NOT TO SCALE




6 C-3 **BOLLARD DETAIL**
NOT TO SCALE

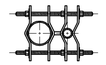



5 C-3 **ICE BRIDGE DETAIL**
NOT TO SCALE




**GPS ANTENNA MOUNTING BRACKET**

| BILL OF MATERIALS | | |
|---|---|---|
| ITEM | DESCRIPTION | QUANTITY |
| 1 | 2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE | 1 |
| 2 | UNIVERSAL CLAMP SET. | 2 |

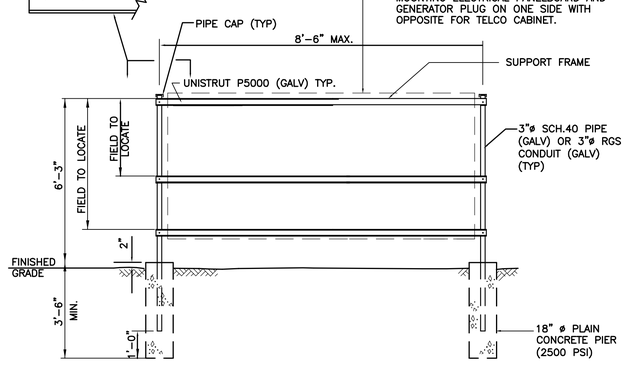


A C-3 **SECTION**
NOT TO SCALE

## NOTES:

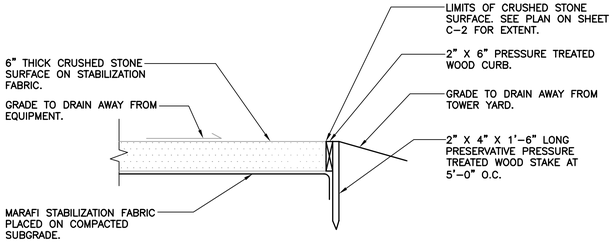
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. ATTACH TO ICE BRIDGE POST NEAREST ANTENNA CABLE PORT AT EQUIPMENT.
4. PRIOR TO INSTALLATION CONTRACTOR SHALL TEST GPS LOCATION WITH HAND HELD AND MOVE GPS ANTENNA TO OTHER ICE BRIDGE POSTS AS REQUIRED TO ACHIEVE ADEQUATE SIGNAL. FAILURE TO ACHIEVE ADEQUATE SIGNAL WITH A HAND HELD GPS SHALL BE REPORTED TO CONSTRUCTION MANAGER AND ENGINEER TO DETERMINE ALTERNATE INSTALLATION LOCATION FOR GPS ANTENNA.

2 C-3 **GPS GROUNDING/MOUNTING BRACKET DETAIL**
NOT TO SCALE

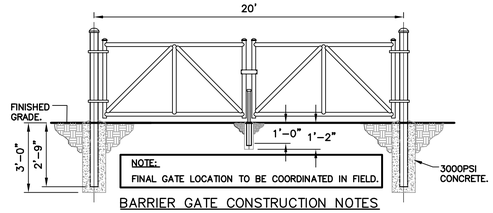



NOTES:
1. PROVIDE 3/4" PRESSURE TREATED PLYWOOD PAINTED BATTLESHIP GREY ON ALL SIDES (TWO COATS) AND COVERED BY A GALV. STEEL OR PVC DRIP CAP.
2. CONTRACTOR TO MAKE PROVISIONS FOR MOUNTING ELECTRICAL PANELBOARD AND GENERATOR PLUG ON ONE SIDE WITH OPPOSITE FOR TELCO CABINET.

4 C-3 **UTILITY SUPPORT FRAME (TYP)**
NOT TO SCALE




3 C-3 **COMPOUND SURFACING DETAIL**
NOT TO SCALE




BARRIER GATE CONSTRUCTION NOTES

1. GATE POST 3" ø SCHEDULE 40 FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING BARRIER GATE PER ASTM-F1083.
2. GATE FRAME: 2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
3. CENTER UPRIGHT AND ANGLE BRACES: 1 5/8" ø SCHEDULE 40 PIPE PER ASTM-F1083.
4. HINGES: INDUSTRIAL OFFSET HINGES (I.O.H.).
5. INDUSTRIAL DROP ROD AND LATCH.
6. PROVIDE CAPS ON POSTS AND UPRIGHTS.

1 C-3 **BARRIER GATE DETAIL**
NOT TO SCALE — SITE ENTRANCE

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SITE DETAILS

C-3

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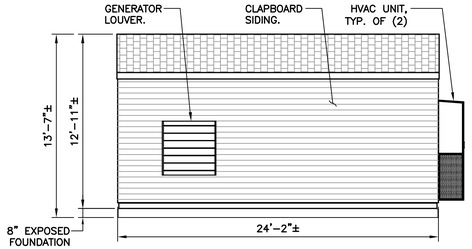
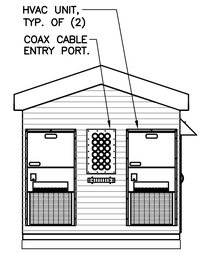
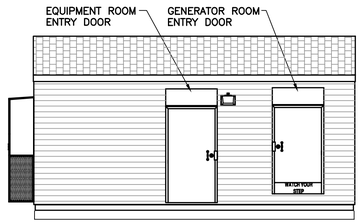


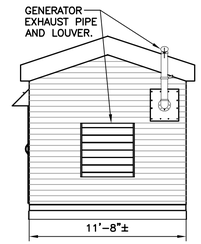

SOUTHWEST ELEVATION




SOUTHEAST ELEVATION

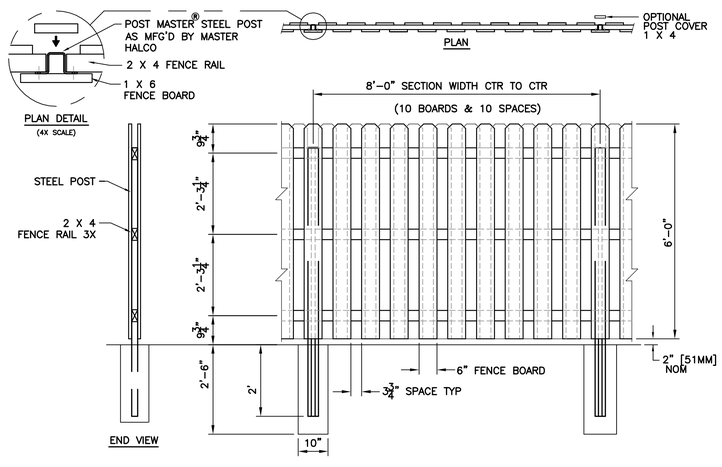



NORTHEAST ELEVATION

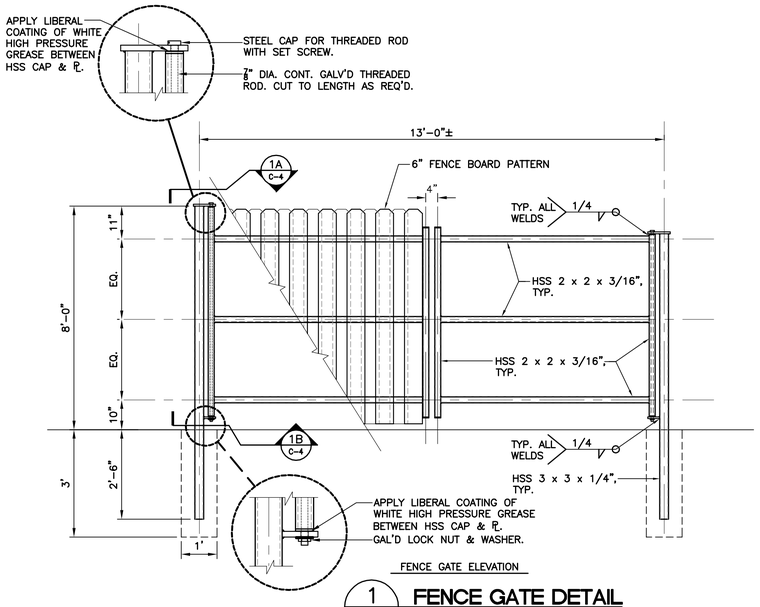



NORTHWEST ELEVATION

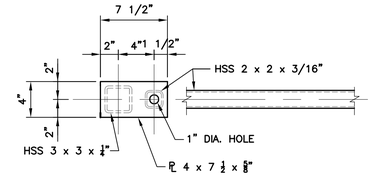
3 / C-4 **EQUIPMENT SHELTER ELEVATIONS**
SCALE: 3/16" = 1'-0"



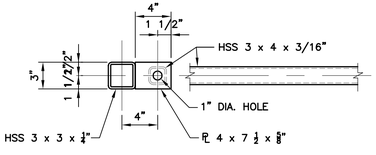

2 / C-4 **FENCE DETAIL**
NOT TO SCALE




1 / C-4 **FENCE GATE DETAIL**
NOT TO SCALE




1A / C-4 **UPPER POST SECTION**
NOT TO SCALE




1B / C-4 **UPPER POST SECTION**
NOT TO SCALE

FENCE & GATE NOTES:

1. ALL STEEL FENCE GATE COMPONENTS SHALL BE GALVANIZED. STEEL FENCE GATE MEMBERS SHALL BE SHOP WELDED AND GALV'D AFTER FABRICATION.
2. ALL WOOD COMPONENTS SHALL BE WHITE CEDAR. DIMENSIONS SHOWN ARE NOMINAL.
3. ALL METAL FENCE POSTS (OTHER THAN GATE) AND ASSOCIATED ACCESSORIES AND SCREWS ARE TO BE POST MASTER BY MASTER HALCO OR APPROVED EQUAL.
4. ALL VERTICAL GATE FRAMING MEMBERS SHALL HAVE ¼" WELDED END PLATE CAPS.

WOOD FENCE COMPONENT FINISH:

ALL WOOD COMPONENTS TO RECEIVE MINIMUM (2) COATS OF VALSPAR PREMIUM PENETRATING OIL DECK & SIDING TONER OR APPROVED EQUAL. FIRST COAT TO BE APPLIED PRIOR TO ASSEMBLY. APPLY COATING PER MANUFACTURER'S WRITTEN RECOMMENDATIONS.

FASTENERS:

WOOD-TO-STEEL: 1 ½" LNG #8-25 GA., FLUSH HEAD HILTI KWIK-PRO GALV'D SELF-DRILLING SCREWS (2 SCREWS AT EA. RAIL LOCATION, TYP.)

WOOD-TO-WOOD: REFER TO POST MASTER BY HALCO FOR REQUIRED FASTENERS.

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**C-4**

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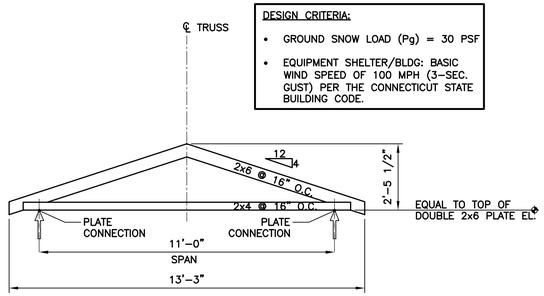
**EQUIPMENT SHELTER BY CELLXION. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.**

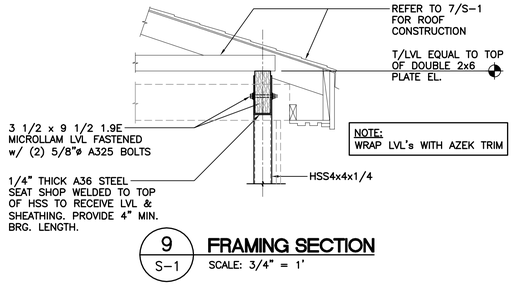
**SLAB ON GRADE FOUNDATION DESIGN CONFORMS TO THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE SUPPLEMENT SECTION 1805.2.1 'FROST PROTECTION' AND SEI/ASCE STANDARD 32-01 SECTION 7.1 'SLAB ON GRADE CONSTRUCTION'.**

## FOUNDATION PLAN NOTES:

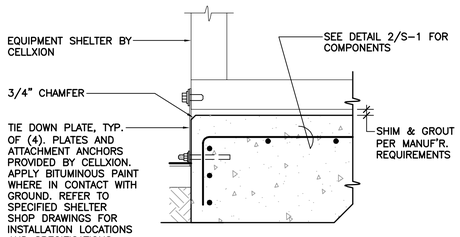
1. BEARING SHIMS, TIE-DOWN PLATES AND ASSOCIATED INSTALLATION ANCHORS PROVIDED BY CELLXION. CONTRACTOR SHALL VERIFY ALL SHIM & TIE-DOWN QUANTITIES AND LOCATIONS WITH CELLXION PRIOR TO PERFORMING FOUNDATION WORK.
2. SLAB/ TOP OF WALL TOLERANCE IS 1/4"±
3. TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.
4. REFER TO NOTES ON DWG. N-1 FOR ADDITIONAL REQUIREMENTS.
5. PER NEC REQUIREMENTS, THE REBAR IN FOUNDATION AND FOOTING SHALL BE BONDED TO GROUND RING WITH A #2 AWG SOLID CONDUCTOR USING LISTED AND APPROVED METHODS.
6. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH FOUNDATION OR CAST CONDUITS IN PLACE. REFER TO ELECTRICAL DRAWINGS FOR CONDUIT SIZES AND QUANTITIES.



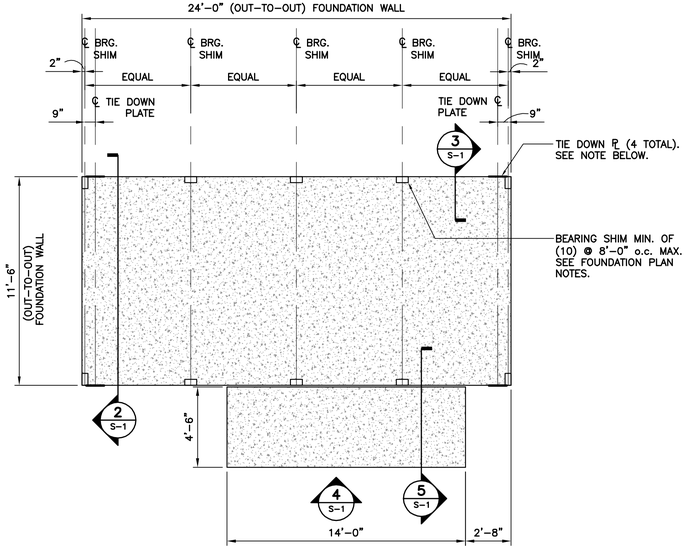

8 S-1 **ROOF TRUSS SECTION - DESIGN SCHEMATIC**
SCALE: 3/8" = 1'



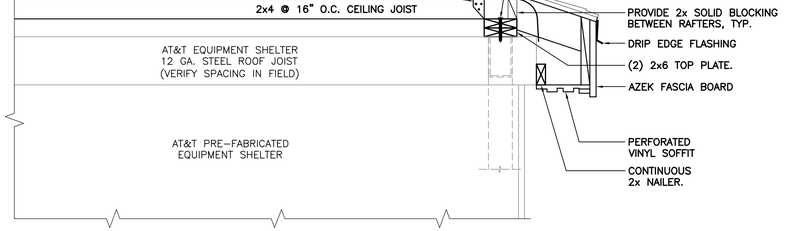

9 S-1 **FRAMING SECTION**
SCALE: 3/4" = 1'



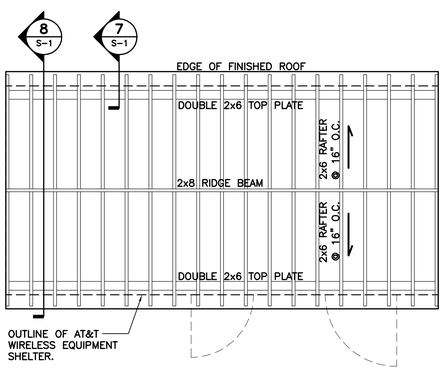

3 S-1 **BUILDING TIE DOWN**
SCALE: 1" = 1'




1 S-1 **FOUNDATION PLAN**
SCALE: 1/4" = 1'
APPROX. GRID NORTH



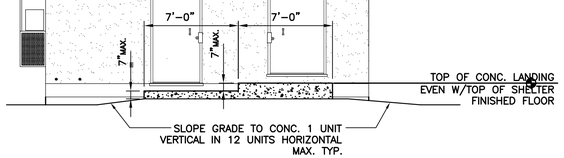

7 S-1 **SOFFIT AND TRUSS CONNECTION DETAIL**
SCALE: 1" = 1'



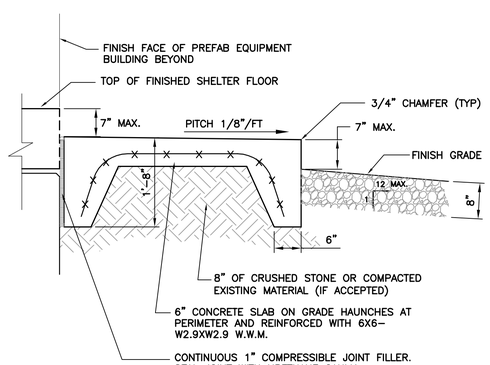

6 S-1 **ROOF FRAMING PLAN**
SCALE: 1/4" = 1'

## ROOF FRAMING PLAN NOTES:

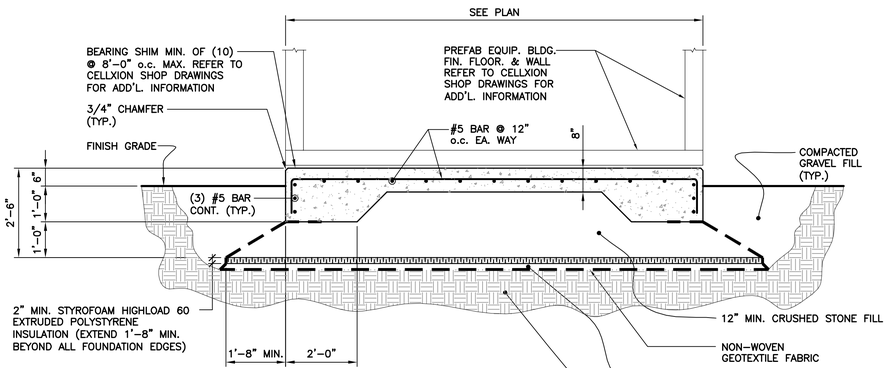
1. CEILING JOISTS SHALL BE 2x6 D.F. #2 AT 16" O.C.
2. ——→ INDICATES SLOPING MEMBER
3. REFER TO DRAWING N-1 FOR STRUCTURAL LUMBER REQUIREMENTS AND ADDITIONAL INFORMATION.




4 S-1 **ENTRY STOOP DETAIL - ELEVATION**
SCALE: 3/16" = 1'




5 S-1 **ENTRY STOOP DETAIL - SECTION**
SCALE: 3/16" = 1'




2 S-1 **FOUNDATION PLAN SLAB ON GRADE**
SCALE: 1/2" = 1'

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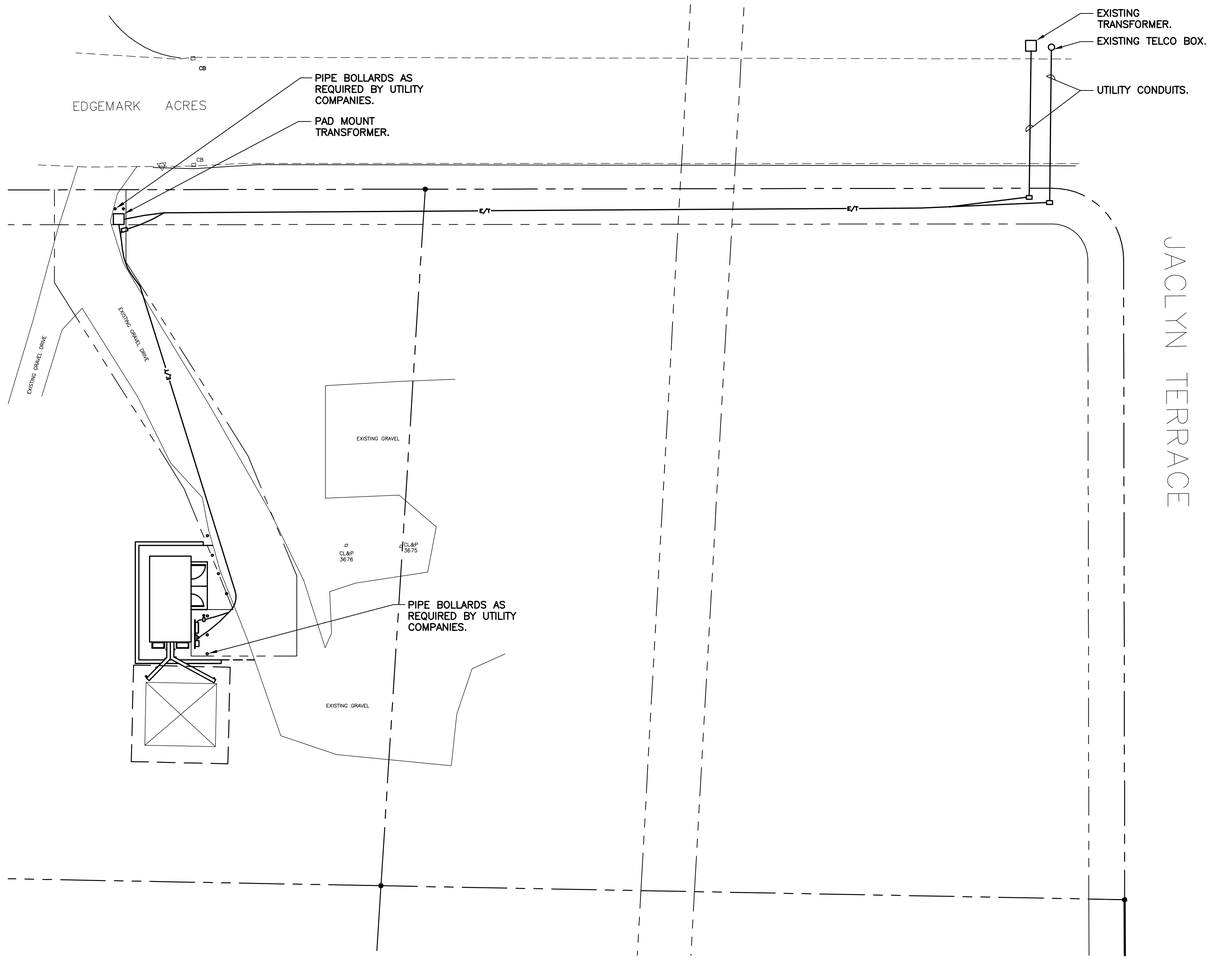
| JOB NO. | 13305.000 |

FOUNDATION PLAN, ROOF FRAMING PLAN AND DETAILS

**S-1**

Sheet No. 8 of 17




1 E-1 **COMPOUND PLAN**
SCALE: 1" = 20'-0"

APPROX. NORTH

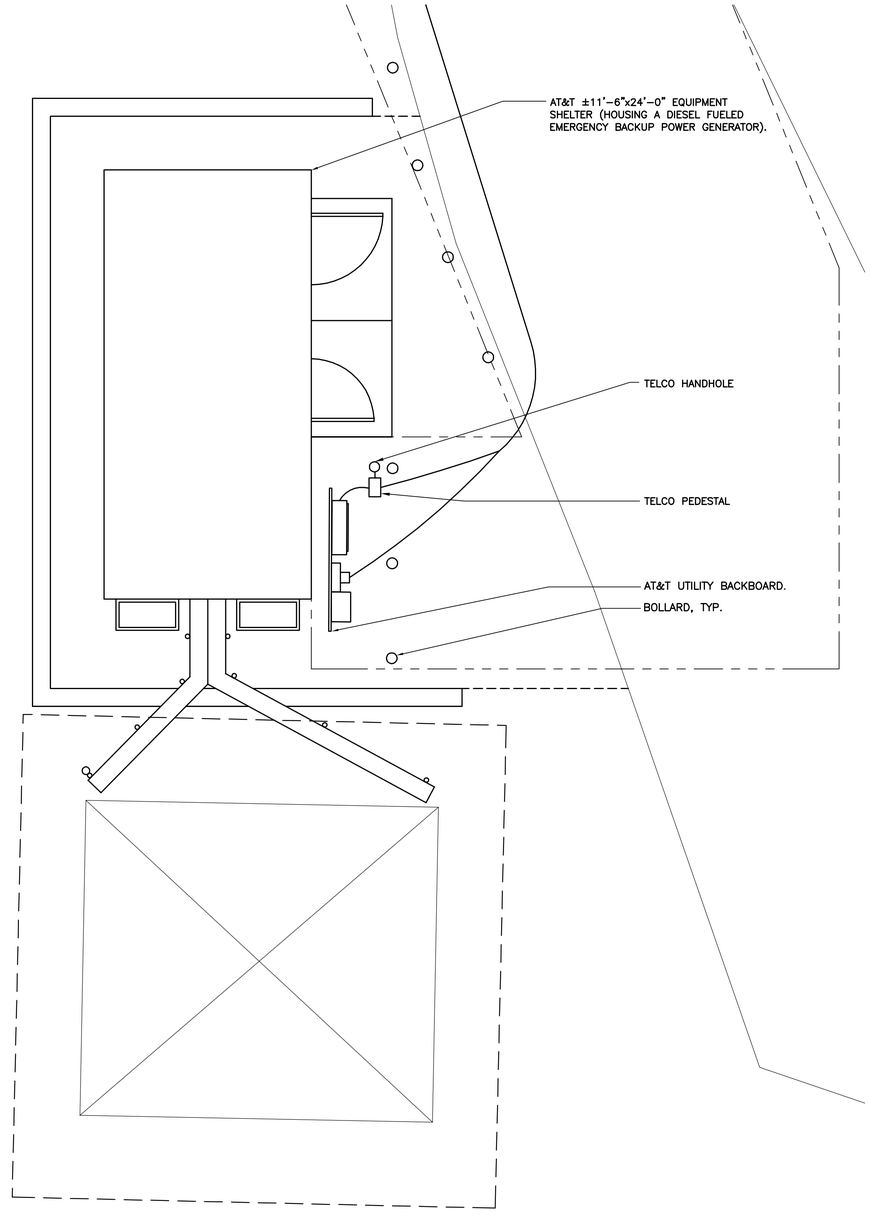
GRAPHIC SCALE
20 0 10 20 40 80
( IN FEET )
1 inch = 20 ft.

## ELECTRICAL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| —— - - —— | PROPERTY LINE |
| —— - - - —— | ACCESS/ UTILITY EASEMENT LINE (PROPOSED) |
| ——E/T—— | ELECTRICAL/TELCO CONDUIT RUN (UNDERGROUND) |
| ——O/H—— | UTILITY LINES (OVERHEAD BY UTILITY CO.) |
| O□ | UTILITY PULL BOX/SILO |
| ◊ | UTILITY POLE |

## UTILITY NOTES

1. COORDINATE WITH OWNER FOR ALL EASEMENT DOCUMENTS.
2. UTILITY ROUTING SHOWN ON THIS PLAN IS SCHEMATIC. CONTRACTOR SHALL COORDINATE FINAL ROUTING WITH RESPECTIVE UTILITY COMPANIES PRIOR TO PERFORMING ANY UTILITY TRENCH WORK. ALL UTILITY CONDUITS AND PULL BOXES SHALL BE LOCATED WITHIN THE EASEMENT AREA.
3. UTILITY PULL BOXES/SILOS TO BE INSTALLED IN APPROXIMATE LOCATIONS SHOWN ON THIS PLAN. CONTRACTOR TO COORDINATE FINAL PULL BOX LOCATIONS WITH RESPECTIVE LOCAL UTILITY COMPANIES.
4. ALL UTILITY EQUIPMENT SHALL BE LOCATED WITHIN THE EASEMENT AREA. PRIOR TO START OF CONSTRUCTION THE CONTRACTOR SHALL OBTAIN A VALID COPY OF THE EASEMENT MAP FROM THE OWNER.




2 E-1 **COMPOUND PLAN**
SCALE: 1" = 4'-0"

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
( IN FEET )
1 inch = 4 ft.

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SITE UTILITY PLAN

E-1

Sheet No. 9 of 17

## ELECTRICAL LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| ——— — — ——— | GROUND RING |
| –T———T– | UNDERGROUND COMMUNICATION CONDUIT |
| –E———E– | UNDERGROUND ELECTRICAL CONDUIT AS INDICATED |
| | GROUND BAR |
| —o———o— | PERIMETER CHAIN LINK FENCE |
| ⊗ | 5/8" DIAMETER x 10'–0" COPPER GROUND ROD **OR** 24"x24" GROUND PLATE ABOVE MATT FOUNDATION. |
| ⊠ | 5/8" DIAMETER x 10'–0" COPPER GROUND ROD WITH ACCESS. |
| ■ | EXOTHERMIC WELD TYPE "TA" |
| ● | MECHANICAL CONNECTION |
| ⓥ | GROUND WELL |

## GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR ACTUAL LOCATIONS OF STRUCTURES ON SITE.
2. COORDINATION, LAYOUT AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL/TELECOMMUNICATIONS SERVICES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. THE EXACT BUILDING FOUNDATION SIZE AND BUILDING WALL PENETRATIONS FOR UTILITIES SHALL BE CONFIRMED WITH THE BUILDING SPECIFICATIONS AND PLANS PRIOR TO LAYOUT.
4. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
5. PROVIDE CADWELD CONNECTION STYLES: THROUGH (CABLE TO CABLE) TYPE "TA"
   (CABLE TO SURFACE) TYPE "LA" OR "VS" (PIPE)
   (CABLE TO ROD) TYPE "GT" OR "NC"
   (CABLE TO CABLE) TYPE "SS"
6. EXTEND UTILITY SERVICES TO UTILITY BACKBOARD IN PROPOSED OWNERS EQUIPMENT SHELTER. COORDINATE WITH SHELTER SHOP DRAWINGS FOR LOCATION. OWNER TO COORDINATE ALL UTILITY SERVICES TO NEW EQUIPMENT SHELTER.
7. SEE CIVIL SHEETS FOR DETAILS OF FLOOR AND WALL PENETRATIONS.
8. ALL CONDUITS SHALL BE PROPERLY ANCHORED ALONG ENTIRE ROUTE.

**VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK**

## NOTES

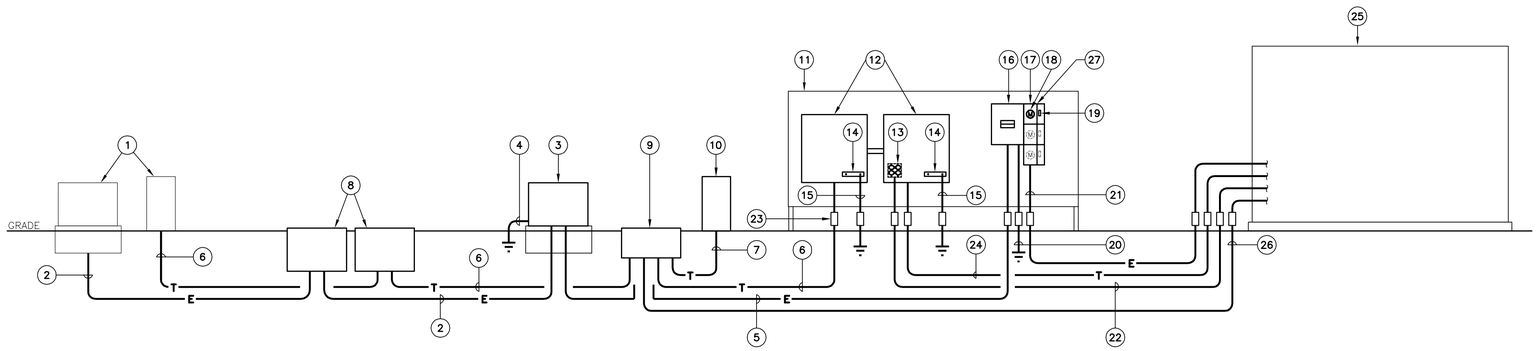
1. CONTRACTOR TO VERIFY ALL CONDUIT ROUTING AND INSTALLATION REQUIREMENTS WITH LOCAL UTILITIES PRIOR TO INSTALLATION.
2. ALL CONDUITS SHALL HAVE EXPANSION COUPLINGS WHERE EXTENDING ABOVE GRADE.
3. ALL UTILITY SUPPLY CONDUITS, CONDUCTORS AND ASSOCIATED EQUIPMENT MUST BE LOCATED WITHIN THE LIMITS OF THE UTILITY EASEMENT. COORDINATE WITH OWNER FOR EASEMENT DOCUMENTATION.
4. REFER TO SITE UTILITY PLAN.
5. TELEPHONE EQUIPMENT SHOWN APPROXIMATE. COORDINATE WITH TELEPHONE UTILITY COMPANY AND PROVIDE ALL SPECIFIED EQUIPMENT.
6. COORDINATE SERVICE EQUIPMENT INTERRUPTING RATING WITH AVAILABLE FAULT CURRENT FROM UTILITY COMPANY. EQUIPMENT SHALL NOT BE RATED LESS THAN 65 KAIC.
7. ALL TELEPHONE AND ELECTRIC UTILITY WORK MUST BE COORDINATED WITH UTILITY COMPANY, AND ALL EQUIPMENT MUST BE UTILITY COMPANY APPROVED. CONTRACTOR SHALL PROVIDE ALL ELEMENTS NOT PROVIDED BY UTILITY COMPANIES.
8. CONDUCTOR SIZES SHALL NOT BE REDUCED OR SUBSTITUTED WITHOUT ENGINEERS APPROVAL.
9. INSTALL PULL ROPES IN ALL EMPTY CONDUITS.
10. ALL CONDUCTORS AND CONDUCTOR TERMINATIONS SHALL BE RATED FOR 75°C OPERATION.
11. COORDINATE WALL PENETRATIONS WITH SHELTER MANUFACTURER.

## ELECTRICAL ABBREVIATIONS

| ABBREVIATION | DESCRIPTION |
|---|---|
| AFF | ABOVE FINISHED FLOOR |
| AIC | AMPERE INTERRUPTING CAPACITY |
| AWG | AMERICAN WIRE GAGE |
| C | CONDUIT |
| EGR | EXTERIOR GROUND RING |
| G – GRD | GROUND |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| IGR | INTERIOR GROUND RING MOUNTED 9'–0" ABOVE FINISHED FLOOR |
| KWH | KILO–WATT–HOUR |
| MCCB | MOLDED CASE CIRCUIT BREAKER |
| MDP | MAIN DISTRIBUTION PANEL |
| NC | NORMALLY CLOSED |
| OC | ON CENTER |
| SA | SURGE ARRESTOR |
| VM | VOLTAGE MONITOR |
| WP | WEATHERPROOF |
| ER | EXISTING TO REMAIN |
| RR | REMOVE AND RELOCATE |
| RE | RELOCATED EXISTING |
| RGS | RIGID GALVANIZED STEEL |

## NOTES

1. EXISTING TRANSFORMER AND TELCO PEDESTAL TO BE USED. REFER TO SITE SURVEY AND UTILITY PLAN. COORDINATE WITH EACH UTILITY COMPANY.
2. (1) 3" CONDUIT FOR PRIMARY ELECTRIC CONDUCTORS. CONDUCTORS PROVIDED BY UTILITY COMPANY FROM UTILITY POLE TO TRANSFORMER. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER UTILITY COMPANY SPECIFICATIONS. PROVIDE CONCRETE ENCASEMENT (MIN. 3" COVER ALL AROUND) AS REQUIRED BY CL&P. REFER TO NEW SERVICE REQUEST # 229–7566.
3. TRANSFORMER PROVIDED BY UTILITY COMPANY. TRANSFORMER VAULT, HOUSING, AND GROUND GRID BY ELECTRICAL CONTRACTOR, PER UTILITY COMPANY SPECIFICATIONS.
4. PROVIDE TRANSFORMER GROUNDING PER NEC AND UTILITY COMPANY SPECIFICATIONS.
5. TWO SETS OF: (3) 600 KCMIL, (1) 1/0 AWG GROUND, 4"C.
6. TWO 4" CONDUITS WITH PULL ROPES FOR TELEPHONE COMPANY CONDUCTORS. CONDUCTORS PROVIDED BY TELEPHONE COMPANY FROM UTILITY POLE TO UTILITY BOARD. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS, AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER TELEPHONE COMPANY SPECIFICATIONS. CONDUITS SHALL BE ENCASED IN CONCRETE WITH ELECTRICAL CONDUITS, PER AT&T AND U.I. SPECIFICATIONS. PROVIDE SEPARATION BETWEEN UTILITIES AS REQUIRED BY BOTH UTILITY COMPANIES.
7. PROVIDE CONDUIT WITH PULL ROPE BETWEEN HANDHOLE AND PEDESTAL. EXPECT TWO 4" CONDUITS, BUT FINAL SIZE AND QUANTITY PER TELEPHONE COMPANY.
8. TELEPHONE & ELECTRIC JUNCTION/SPLICE BOX. MUST BE TRAFFIC RATED. QUANTITY AND LOCATION PER EACH UTILITY COMPANY SPECIFICATIONS.
9. TELEPHONE COMPANY HANDHOLE. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
10. TELEPHONE COMPANY PEDESTAL. INSTALL PER TELEPHONE COMPANY SPECIFICATIONS.
11. UTILITY BACKBOARD. REFER TO CIVIL DRAWINGS.
12. TWO 3'x4'x1' NEMA–3R TELEPHONE ENCLOSURES INSTALLED NEXT TO EACH OTHER ON UTILITY BACKBOARD. MAINTAIN APPROXIMATELY 1' SEPARATION BETWEEN AND INSTALL A SECTION OF 4" CONDUIT CONNECTING BOTH BOXES.
13. PROVIDE DOUBLE DUPLEX, GFI RECEPTACLE IN WEATHERPROOF ENCLOSURE INSIDE OF TELEPHONE ENCLOSURE. CONNECT TO DEDICATED 20A/1P CIRCUIT IN OWNERS ELECTRIC PANEL IN SHELTER.
14. PROVIDE GROUND BAR AS REQUIRED BY TELEPHONE COMPANY.
15. #2 AWG GROUNDING CONDUCTOR IN 3/4" PVC CONDUIT, UNLESS OTHERWISE SPECIFIED BY TELEPHONE COMPANY. BOND TO GROUNDING TRIAD.
16. 800A, 240/120V, 1P, 65 KAIC RATED, NEMA–3R, MAIN CIRCUIT BREAKER MODULE WITH 800A/2P MAIN CIRCUIT BREAKER. (SQUARE–D: EZM1800CBU OR APPROVED EQUIVALENT.) MUST BE UTILITY COMPANY APPROVED.
17. 3–GANG MULTI–METER BRANCH DEVICES WITH 240V, 1P, 3W, 225A RATED METER SOCKETS. (SQUARE–D: EZML113225 OR APPROVED EQUIVALENT). MUST BE UTILITY COMPANY APPROVED. (LEAVE ROOM FOR FUTURE 3–GANG MODULE.)
18. UTILITY COMPANY APPROVED METER FOR AT&T IN AVAILABLE SOCKET. PROVIDE LABEL STATING "AT&T WIRELESS".
19. 200A/2P MAIN CIRCUIT BREAKER IN AVAILABLE POSITION CORRESPONDING TO METER FOR OWNER.
20. 3/0 AWG GROUNDING ELECTRODE CONDUCTOR IN 3/4 PVC CONDUIT BONDED TO GROUNDING TRIAD LOCATED AT UTILITY BACKBOARD. GROUNDING TRIAD SHALL BE BONDED TO COMPOUND GROUND RING WITH #2 AWG SOLID TINNED BARE COPPER WIRE.
21. (3) #3/0 AWG, (1) #6 AWG GROUND, 2–1/2"C. FROM METER TO TRANSFER SWITCH IN SHELTER.
22. (2) #12 AWG, #12 AWG GROUND, 3/4"C. FROM DEDICATED 20A/1P CIRCUIT BREAKER IN OWNERS POWER PANEL TO RECEPTACLE IN TELCO BOXES.
23. EXPANSION COUPLING, TYPICAL.
24. 4" PVC CONDUIT FOR TELEPHONE SERVICE. PROVIDE TELEPHONE CABLES AS REQUIRED BY TELEPHONE COMPANY AND OWNER. EXTEND TO OWNERS TELCO BOARD IN SHELTER.
25. AT&T EQUIPMENT SHELTER.
26. 4" PVC CONDUIT FROM HANDHOLE TO TELCO BOARD IN SHELTER. PROVIDE TELEPHONE CABLES AS REQUIRED BY TELEPHONE COMPANY AND OWNER.
27. PROVIDE LABEL AT METER LISTING TYPE AND LOCATION OF ON SITE STANDBY GENERATOR.




1 / E–2 **RISER DIAGRAM**
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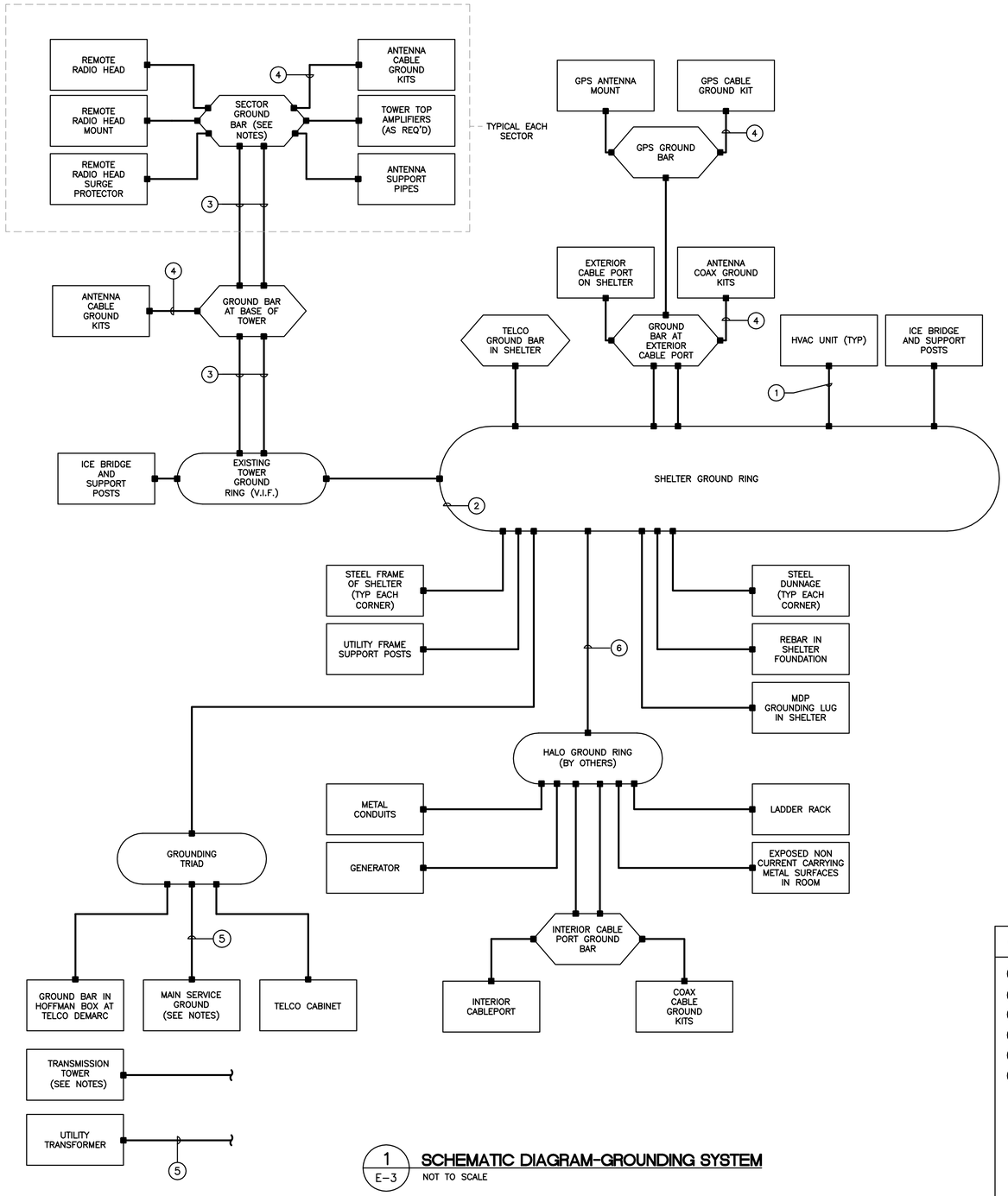
ELECTRICAL RISER DIAGRAM, NOTES AND LEGEND

**E-2**




1 / E-3 **SCHEMATIC DIAGRAM-GROUNDING SYSTEM**
NOT TO SCALE

## CELLULAR GROUNDING NOTES

OBJECTIVE

PROVIDE A CELLULAR GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. PROVIDE EXTERIOR GROUNDING SCHEME WITH OWNERS APPROVAL AS REQUIRED TO ACHIEVE DESIRED MAXIMUM AC RESISTANCE TO GROUND. CONNECT

TESTING

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL. TEST TO BE PERFORMED PRIOR TO CONNECTION OF POWER SUPPLY TO THE CELL SITE AND CONNECTION OF THE GROUNDING SYSTEM TO THE WATER MAIN OR AC SUPPLY AS APPLICABLE.

CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM

EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER
IGR – #2 AWG ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION
INTER-BUS EXTENSION (FROM IGR TO EGR) – SEE DETAILS
EXTERNAL BOND CONNECTIONS TO EGR – #2 ANNEALED SOLID TINNED BARE COPPER
INTERIOR BOND CONNECTIONS TO IGR – #6 ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION

MINIMUM BENDING RADIUS

IGR #2 : 1'–0" NOMINAL AND 8" MINIMUM
EGR #2 : 2'–0" NOMINAL AND 8" MINIMUM
CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 6" BENDING RADIUS.

FASTENER FOR CELLULAR GROUNDING CONDUCTOR

USE NON–METALLIC FASTENER AND STANDOFF 'CLIC' (AVAIL. FROM NEFCO 203–289–0285) TO SURFACE SUPPORT CONDUCTOR 3" AWAY FROM SURFACES.

SPACING OF FASTENERS: 2'–0" O.C. OUTSIDE BUILDING
3'–0" O.C. INSIDE BUILDING

GROUNDING ELECTRODE

GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 10'–0" l. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACE GROUNDING ELECTRODES 8'–0" TO 10'–0" APART. ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'–6" BELOW FINISH GRADE.

CONNECTIONS ABOVE GRADE (MECHANICAL)

COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V RATED. USE 1/4" ø BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.)

EXOTHERMIC WELD LUG CONNECTOR – 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2"ø BOLT, 1–3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED.

C–TAP COMPRESSION CONNECTOR – HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

MECHANICAL CONNECTIONS

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION.

APPLY ANTI–OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED.

SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

WHEN BONDING #2 TO #2

EXTERIOR OF BUILDING – USE EXOTHERMIC WELD CONNECTION
INTERIOR OF BUILDING – USE COMPRESSION CONNECTION ON STRANDED CONDUCTORS ONLY.
– USE EXOTHERMIC WELD CONNECTION ON SOLID CONDUCTOR.

WHEN BONDING #2 TO FENCE POST

USE EXOTHERMIC WELD 'CADWELD TYPE VS' CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THRU. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS

GROUNDING SYSTEM INTERCONNECTION

BOND THE EGR DOWN CONDUCTORS, AND/OR BURIED GROUND RING TO ANY METALLIC OBJECT OR EXISTING GROUNDING SYSTEM WITHIN 6'.

WHEN BONDING #2 TO TOWER GROUND PLATE

TOWER GROUND PLATE SHALL BE 6" x 8" x 1/4" COPPER AND BE MADE AVAILABLE TO TOWER CONTRACTOR TO BE INSTALLED DURING TOWER CONSTRUCTION. USE EXOTHERMIC WELD 'CADWELD TYPE HS' TO TOWER GROUND PLATE TEST WELD FOR POSSIBLE BURN THRU. COORDINATE THE SIZE OF THE MOUNTING HOLE WITH TOWER CONTRACTOR.

METALLIC CONDUITS

BOND ALL STEEL CONDUITS TO PANELS AT POINT OF CONTACT WITH APPROVED GROUNDING BUSHING.

## GROUNDING SCHEMATIC NOTES

1. #2 AWG GREEN INSULATED
2. GROUND RING, #2 AWG BCW
3. #2/0 GREEN INSULATED
4. #6 AWG
5. REFER TO RISER DIAGRAM FOR SPECIFICATIONS
6. BOND ALL HALO GROUND RING TAILS TO GROUND RING. COORDINATE LOCATION AND QUANTITY WITH EQUIPMENT ROOM/SHELTER DRAWINGS

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. GROUND CONDUCTORS SHOWN SHALL BE #2 AWG SOLID TINNED BCW UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
7. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
8. COORDINATE ALL TOWER MOUNTED EQUIPMENT REQUIREMENTS WITH OWNER.
9. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
10. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
11. ALL EXPOSED METAL OBJECTS IN SHELTER SHALL BE BONDED TO THE HALO GROUND WITHIN THAT ROOM.
12. REFER TO RISER DIAGRAM FOR SPECIFICATIONS OF SERVICE GROUND AND TRANSFORMER GROUND.
13. COORDINATE WITH CL&P TRANSMISSION DEPARTMENT REPRESENTATIVE TO DETERMINE ADDITIONAL GROUNDING REQUIREMENTS. PROVIDE ALL REQUIRED ELEMENTS TO MEET CL&P APPROVAL.
14. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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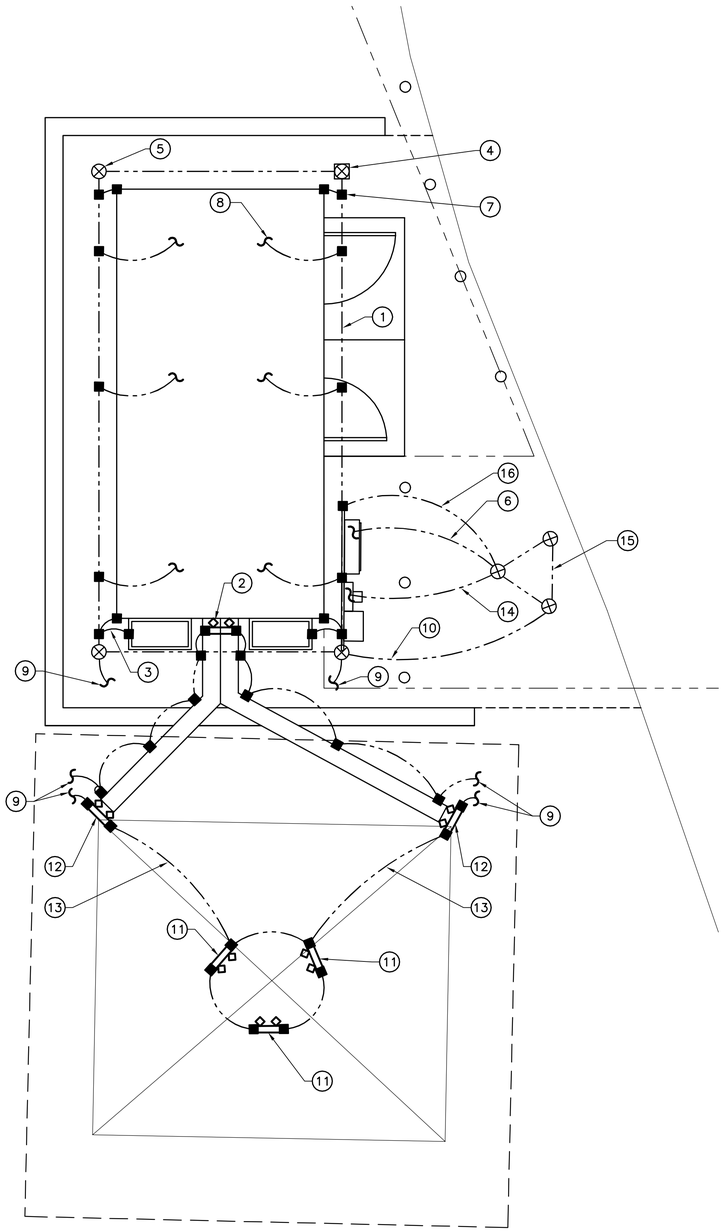
**SITE NUMBER: CT2117**
**200 EDGEMARK ACRES**
**MERIDEN, CT 06451**

DATE: 11/03/14
SCALE: AS NOTED
JOB NO. 13305.000

ELECTRICAL GROUNDING SYSTEM

**E-3**

Sheet No. 11 of 17




1 / E-4 **GROUNDING PLAN**
SCALE: 1" = 4'

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
( IN FEET )
1 inch = 4 ft.

## GROUNDING PLAN NOTES

1. #2 SOLID TINNED BCW GROUND RING (TYP. 2'-0" FROM OUTSIDE EDGE OF EQUIPMENT SHELTER FOUNDATION) (TYP.).
2. WAVEPORT GROUND BAR SEE DETAIL.
3. BOND HVAC UNITS TO GROUND RING.
4. GROUNDING ROD WITH ACCESS (TYP.) SEE DETAILS.
5. GROUNDING ROD (TYP.) SEE DETAILS.
6. TELEPHONE CABINET GROUNDING. (SEE RISER DIAGRAM).
7. CADWELD EQUIPMENT BUILDING TO GROUND RING (TYP).
8. BOND SHELTER TAIL GROUND LEADS TO SHELTER GROUND RING (TYP. 6 PLACES).
9. BOND TO EXISTING TOWER GROUND RING. CONTRACTOR TO VERIFY LOCATION/CONFIGURATION IN FIELD. COORDINATE WITH TOWER OWNER. (TYP.)
10. BOND GROUNDING TRIAD TO GROUND RING.
11. UPPER TOWER MOUNTED SECTOR GROUND BAR.
12. LOWER TOWER MOUNTED GROUND BAR.
13. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR (2 GROUND LEADS).
14. MAIN SERVICE GROUND. (SEE RISER DIAGRAM).
15. GROUNDING TRIAD (REFER TO DETAIL).
16. BOND UTILITY FRAME SUPPORT POSTS TO GROUNDING TRIAD.

## NOTES

1. COORDINATE WITH RISER DIAGRAM, GROUNDING SYSTEM SCHEMATIC DIAGRAM, AND ALL GROUNDING DETAILS.
2. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
3. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY TOWER OWNER PRIOR TO INSTALLATION.
4. PROVIDE ANY ADDITIONAL GROUNDING ELEMENTS REQUIRED BY TOWER OWNER.
5. SOME LANDSCAPING NOT SHOWN FOR CLARITY. REFER TO CIVIL DRAWINGS.

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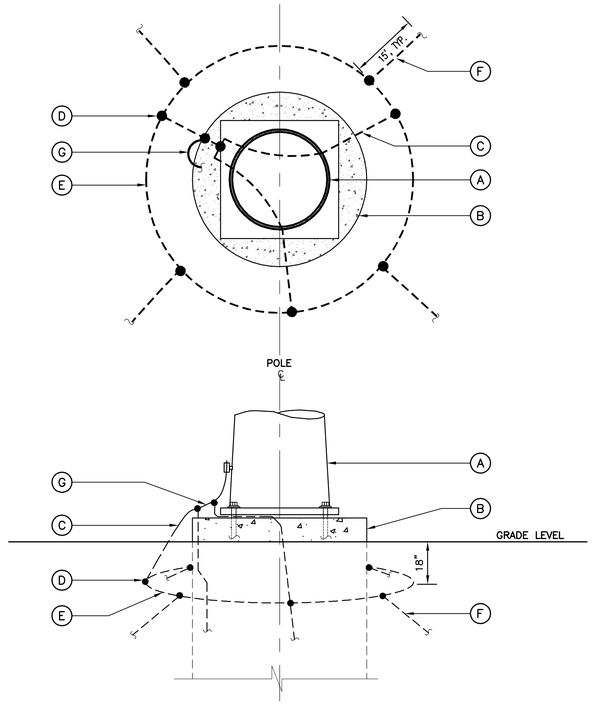
ELECTRICAL GROUNDING PLAN

# E-4




1 / E-5 **NU TOWER GROUNDING DETAIL**

NOT TO SCALE

## NU TOWER GROUNDING NOTES:

**(NORTHEAST UTILITIES REQUIREMENTS)**

(A) STEEL HYBRID POLE.

(B) CONCRETE CAISSON TYPE FOUNDATION.

(C) STRANDED COPPERWELD SPOKE FROM POLE GROUND TO GRADING RING. SPOKES ARE A CONTINUATION OF STRANDED COPPERWELD COUNTERPOISE CONNECTING GRADING RING TO POLE GROUND. SPOKES TO SLOPE ON STRAIGHT LINE FROM GROND LEVEL TO GRADING RING.

(D) PARALLEL GROVE CONNECTOR, NU SC190052.

(E) GRADING RING @ 18" MINIMUM BELOW GRADE AND 24" TO 30" FROM TOWER FOUNDATION. GRADING RING TO BE 3 NO. 8 STRANDED ANEALED COPPERWELD.

(F) COUNTERPOISE, 3 NO. 8 STRANDED ANEALED COPPERWELD (TYPICAL).

(G) COPPERWELD POLE GROUND.

GENERAL NOTES:

1. THE INFORMATION ON THIS SHEET REPRESENTS TYPICAL NORTHEAST UTILITIES GROUNDING REQUIREMENTS. CONTRACTOR MUST COORDINATE WITH NORTHEAST UTILITIES SITE MANAGER FOR SPECIFIC (AND CURRENT) GROUNDING REQUIREMENTS AT THIS SITE.

## NORTHEAST UTILITIES - TOWER GROUNDING SYSTEM NOTES

GENERAL–

1. THE OWNER WILL FURNISH THE WIRE, CONNECTORS, AND MISCELANEOUS MATERIAL ASSOCIATED WITH THE COUNTERPOISE GROUNDING SYSTEM.
2. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO INSTALL THE GROUNDING SYSTEM AND TO REHABILITATE THE RIGHT–OF–WAY AS CLOSE AS POSSIBLE TO ITS ORIGINAL CONDITION.
3. THE CONTRACTOR SHALL HANDLE AND TRANSPORT THE OWNER SUPPLIED MATERIAL FROM THE OWNER'S STOREROOMS AND YARDS TO THE JOB SITE AND SHALL RETURN SURPLUS MATERIAL AND EMPTY REELS TO DESIGNATED STOREROOMS AND YARDS UPON COMPLETION OF THE CONTRACT.
4. NORTHEAST UTILITIES WILL BE RESPONSIBLE FOR PERFORMING TESTS FOR SURGE IMPEDANCE AND WAVE IMPEDENCE.

INSTALLATION–

1. UNLESS OTHERWISE DURECTED BY THE OWNER'S REPRESENTATIVE, COUNTERPOISE SHALL BE BURIED A MINIMUM OF 24" IN CULTIVATED AREAS AND 18" IN WOODED OR OTHER AREAS. IN ROCKY AREAS OR WHERE OBSTRUCTIONS ARE ENCOUNTERED, THE COUNTERPOISE SHALL BE DIVERTED AROUND SUCH OBSTRUCTIONS. ALL INSTALLATIONS SHALL INCLUDE CONNECTIONS TO EXISTING OR PROPOSED STRUCTURES, AND SUCH CONNECTIONS SHALL BE MADE BELOW GROUND USING BOLTED PARALLEL GROVE CONNECTORS.
2. WHERE MULTIPLE STUCTURE GROUNDS EXIST AT MULTI POLE STRUCTURES, THEY SHALL BE CONNECTED TOGETHER WITH BURIED COPPERWELD WIRE, BUT ONLY IF SUCH GROUNDS HAVE METALLIC CONNECTIONS UP THE POLES TO THE SHIELD WIRE(S). AT STRUCTURES THAT HAVE PALE GROUNDS AND ALSO POLE GUY GROUNDS, CONNECTIONS SHALL BE MADE ONLY TO THE POLE GROUNDS, AND THE MINIMUM SPACING BETWEEN THE COUNTERPOISE AND ANCHOR RODS SHALL BE 10'. AT WOOD POLE STRUCTURES WHERE NO SUCH POLE GROUND EXISTS, COUNTERPOISE CONNECTIONS SHALL BE MADE TO THE POLE TOP GUYS.
3. FOR SINGLE COUNTINUOUS (TYPE A) AND SINGLE BROKEN (TYPE B) COUNTERPOISE, THE WIRE SHALL IN GENERAL BE LAYED AT THE CENTERLINE OF THE TRANSMISSION LINE. FOR DOUBLE CONTINUOUS (TYPE C) AND DOUBLE BROKEN (TYPE D) COUNTERPOISE, THE WIRES SHALL IN GENERAL SHALL BE LAYED UNDER THE OUTSIDE PHASE WIRES OF THE TRANSMISSION LINE. COUNTERPOISE SHALL NOT BE INSTALLED ACROSS BROOKS, RIVERS, HIGHWAYS, RAILROADS, OR IN THE VICINITY OF TELEPHONE CABLES OR PIPELINES.
4. AT STEEL POLE STRUCTURES, A BURIED GRADING RING AND SPOKES SHALL ALSO BE INSTALLED AROUND THE STRUCTURE UNLESS THE STRUCTURE HAS A PAD AND PIER FOUNDATION OR UNLESS A RING ALREADY EXISTS. COUNTERPOISE WIRE SHALL BE CONNECTED AT TWO PLACES TO EACH RING, AND COPPERWELD SPOKES SHALL SLOPE LINEARLY UP TO THE STRUCTURE GROUND.
5. AT WOOD POLE STRUCTURES, AN 8' LENGTH OF PLASTIC MOULDING SHALL BE STAPLED OVER THE BOTTOM WITH 8' OF DOWNLEAD.

GROUND RODS–

1. WHERE GROUND RODS ARE REQUIRED, THEY SHALL BE SINGLE OR SECTIONAL WITH THE LENGTH SPECIFIED. THEY SHALL BE DRIVEN VERTICALLY INTO THE GROUND TO A DEPTH WHICH WILL LEAVE THE TOP OF THE ROD AT LEAST 12" BELOW GRADE. ALL RODS SHALL BE CONNECTED TO COUNTERPOISE OR TO POLE GROUNDS USING BOLTED CONNECTORS.

REHABILITATION–

1. SELECTIVE CLEARING PROCEDURES WERE USED IN THE DEVELOPMENT OF THE RIGHT–OF–WAY, AND GROWTH OF SELECTED SPECIES HAS BEEN SAVED. THE CONTRACTOR SHALL NOT VIOLATE THE OWNER'S INTENT TO SAVE SELECTIVE SPECIES AND IMPOSE THE MINIMUM ENVIRONMENTAL IMPACT ON THE RIGHT OF WAY DURING THE EXECUTION OF THE WORK. THE CONTRACTOR SHALL REVIEW THE ROUTING OF EACH SECTION OF COUNTERPOISE WITH THE OWNER'S REPRESENTATIVE PRIOR TO ITS FIELD SPECIFIED LOCATION. THE CONTRACTOR IS RESPONSIBLE TO THE OWNER FOR DAMAGES TO THE RIGHT–OF–WAY IN OTHER THAN THE FIELD SPECIFIED LOCATIONS.
2. ANY BRUSH ALONG THE FIELD SPECIFIED COUNTERPOISE ROUTES WHICH IS LEFT IN AN UNSIGHTLY CONDITION BY THE INSTALLATION WORK WILL BE CUT TO THE GROUND BY THE CONTRACTOR AND LEFT IN SMALL, NEAT PILES IN PLACE WHERE CUT.
3. IN LOCATIONS WHERE EXCAVATION FOR THE INSTALLATION OF COUNTERPOISE BRINGS TO THE SURFACE ANY SMALL BOULDERS, THEY WILL BE BACKFILLED BELOW GRADE OR DIPERSED ON THE RIGHT–OF–WAY AS THE OWNER'S REPRESENTATIVE MAY DIRECT. INSTALLATION OF THE COUNTERPOISE SHALL NOT RESULT IN A PATH OF SMALL BOULDERS ON THE FINISHED SURFACE.
4. THE OWNER ANTICIPATES THAT SEASONAL CONDITIONS MAY NOT ALLOW PERMANENT REHABILITATION OF WORK SITES AND THE RIGHT–OF–WAY UPON COMPLETION OF THE INSTALLATION OF THE COUNTERPOISE. WHERE TEMPORARY REHABILITATION HAS BEEN COMPLETED IN ADVERSE SEASON, THE CONTRACTOR SHALL TAKE THE FOLLOWING STEPS:
   A. WATERBARS WILL BE CONSTRUCTED ON ACCESS ROADS AND TRENCH LINES TO SHUNT WATER OFF THIS LINE OF DISTURBED SURFACES AND CONTROL EROSION ALONG THE DISTURBED SURFACE.
   B. ALL DISTURBED SURFACES OF FOUNDATION SITES OR ALONG TRENCH LINES OR ACCESS ROADS WILL BE GRADED AND COVERED WITH HAY MULCH. SUCH DISTURBED SY=URFACES ON SLOPES GREATER THAN ONE (VERTICAL) ON FOUR (HORIZONTAL) SHALL BE COVERED WITH WOOD CHIPS.
5. AS DRYING CONDITIONS PERMIT IN THE SPRING, FOLLOWING COMPLETION OF THE INSTALLATION OF COUNTERPOISE, PERMANENT REHABILITATION OF ALL DISTURBED OR ERODED SURFACES SHALL BE ACCOMPLISHED AS FOLLOWS:
   A. LAWNS, GOLF COURSES, CEMETARIES AND OTHER SIMILAR OCCUPANCIES SHALL BE LOAMED, GRADED, FERTILIZED, SEEDED AND WHERE APPROPRIATE, MULCHED, TO ESTABLISH A REHABILITATION CONSISTANT WITH THE USE ESTABLISHED BY THE OCCUPANT.
   B. GARDENS, OTHER CULTIVATED AREAS AND PASTURES, SHALL BE GRADED AND TOPSOILED TO RESTORE THE DEPTH OF FERTILE SOIL COMMON TO THE ADJACENT GROUND. WHERE APPROPRIATE, SEEDING SHALL BE DONE IN ACCORDANCE WITH STEP C BELOW.
   C. THE CONTRACTOR SHALL SEED ALL DISTURBED AREAS ALONG THE NEW COUNTERPOISE ROUTES. SEED SHALL BE SPREAD AT THE RATE OF 100 LBS. PER ACRE AND SHALL BE AS FOLLOWS OR APPROVED EQUAL:

| | % BY WEIGHT | % BY GERMINATION | % BY PURITY |
|---|---|---|---|
| CREEPING RED FESCUE | 30 | 85 | 98 |
| DOMESTIC RYE | 20 | 90 | 98 |
| KENTUCKY TALL FESCUE | 50 | -- | -- |
| | 100 | | |

   D. ALL OTHER DISTURBED AREAS INCLUDING REMAINING FOUNDATION SITES, ACCESS ROADS, AND REPAIR OF EROSION OF SITUATION SHALL BE SEEDED WITH MIXED SPECIFICATION ABOVE. IN REMOTE AREAS, A CONSERVATION MIX, AS USED BY THE CONNECTICUT STATE PARKS AND FOREST COMMISION MAY BE SUBSTITUTED. ALL AREAS WHICH EXPERIENCED EROSION DAMAGE AND ALL SLOPES OVER ONE (VERTICAL) AND FOUR (HORIZONTAL) WHERE TEMPORARY REHABILITAION WORK HAS BEEN DONE SHALL BE REMULCHED.
6. IT IS IMPERATIVE THAT PERMANENT REHABILITATION BE ACCOMPLISHED IN GOOD TIME, WHICH WILL ALLOW THE OCCUPANT FULL AND UNDISTURBED USE OF THE SITE IN THE SUCCEEDING SEASON, AND TO PREVENT UNNECESSARY AND UNREASONABLE SPREADING OF CONTINUATION OF DISTURBED SURFACES.
7. ANY BRUSH ALONG THE ACCESS ROADS WHICH IS LEFT IN AN UNSIGHTLY CONDITION BY THE WORK CONDUCTED, SHALL BE CUT TO THE GROUND BY THE CONTRACTOR AND LEFT IN SMALL NEAT PILES IN PLACE WHERE CUT.

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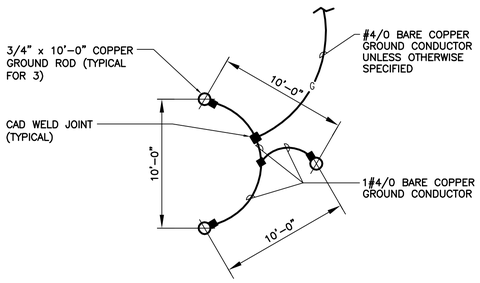
N.U. GROUNDING PLAN, DETAILS AND NOTES

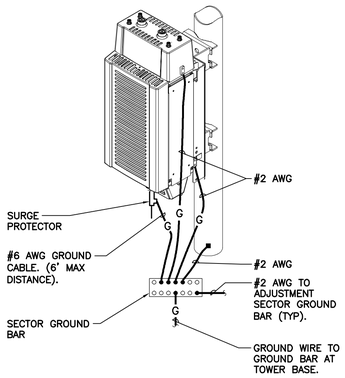
E-5

Sheet No. 13 of 17

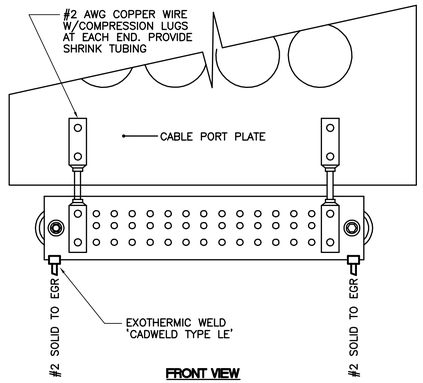



1 E-6 **GROUND TRIAD DETAIL**
NOT TO SCALE

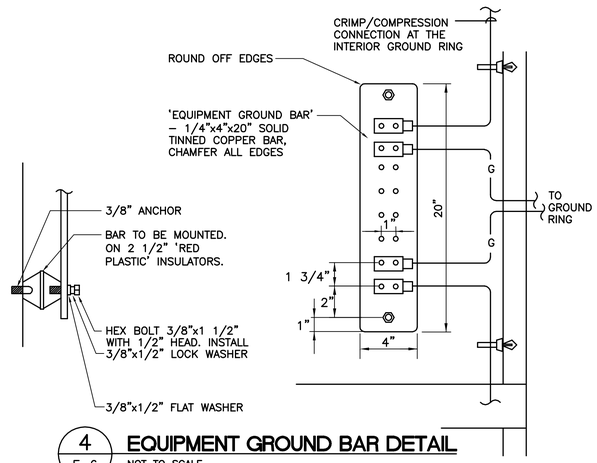
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



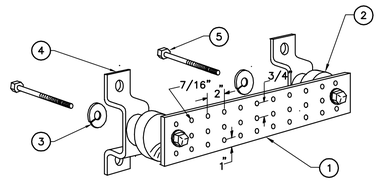

2 E-6 **RRH POLE MOUNT GROUNDING**
NOT TO SCALE




3 E-6 **CABLEPORT GROUND BAR LUG CONNECTION**
NOT TO SCALE




4 E-6 **EQUIPMENT GROUND BAR DETAIL**
NOT TO SCALE




## NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

5 E-6 **GROUND BAR DETAIL**
NOT TO SCALE

**WARNING**
ARC FLASH & SHOCK HAZARD
APPROPRIATE PPE REQUIRED
MAXIMUM AVAILABLE FAULT CURRENT:
XX,XXX AMPS
DATE: MM/DD/YYYY

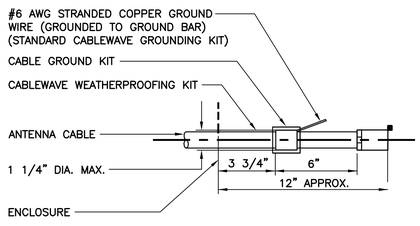
NOTES:
1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SERVICE EQUIPMENT IN ACCORDANCE WITH 2011 NEC 110.24.

6 E-6 **DETAIL OF TYPICAL FAULT CURRENT SIGN**
NOT TO SCALE

**DANGER**
ARC FLASH AND SHOCK HAZARD.
APPROPRIATE PPE REQUIRED.

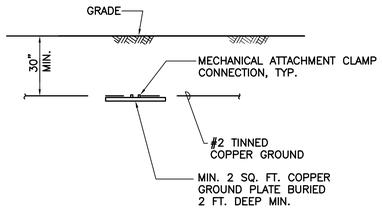
NOTES:
1. REFER TO SPECIFICATIONS FOR FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
2. PROVIDE WARNING LABEL ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS IN ACCORDANCE WITH 2005 NEC 110.16.

7 E-6 **DETAIL OF TYPICAL FLASH PROTECTION WARNING SIGN**
NOT TO SCALE



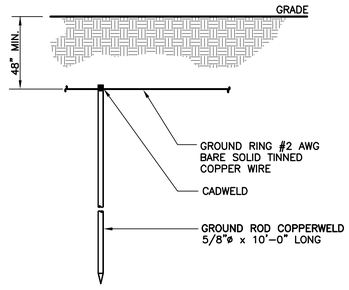

**NOTE:**
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

8 E-6 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE



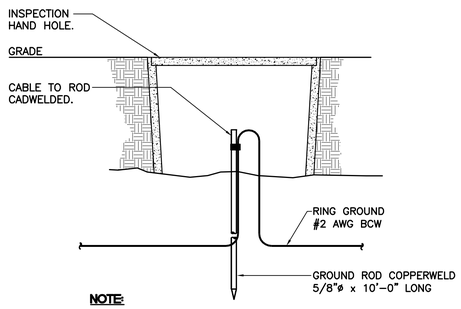

**NOTE:**
1. GROUND PLATE DETAIL TO BE USED ONLY IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

8A E-6 **GROUND PLATE DETAIL**
NOT TO SCALE




**NOTE:**
1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

9 E-6 **GROUND ROD DETAIL**
NOT TO SCALE




**NOTE:**
1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

10 E-6 **GROUND ROD WITH ACCESS DETAIL**
NOT TO SCALE

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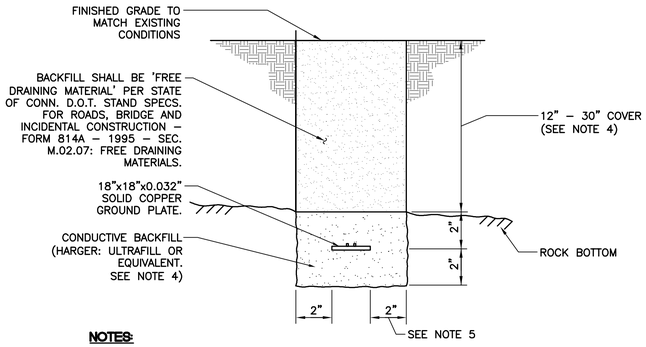
ELECTRICAL DETAILS

**E-6**

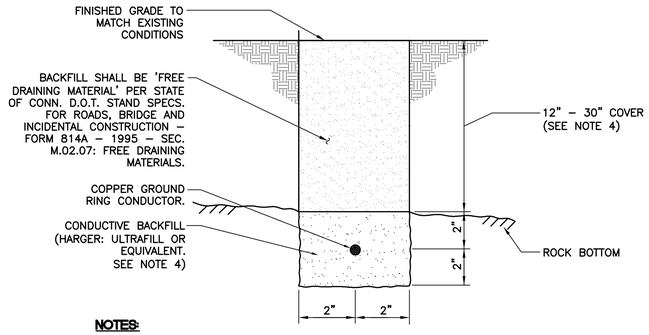
Sheet No. 14 of 17




**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.
5. PROVIDE MIN 2" CLEARANCE ON ALL SIDES OF GROUND PLATE.

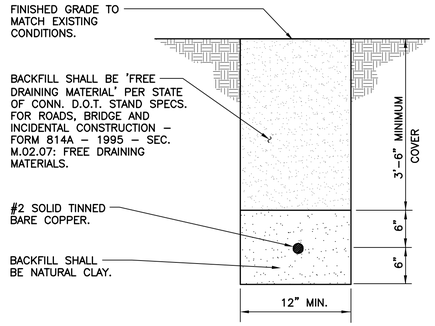
1 / E–7 **GROUND PLATE TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)**
NOT TO SCALE




**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.

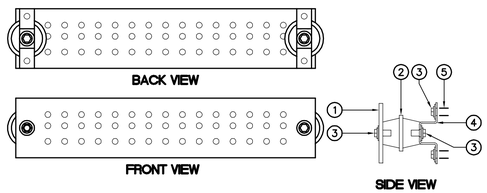
2 / E–7 **EGR TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)**
NOT TO SCALE



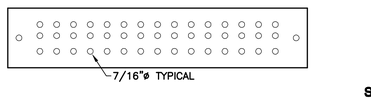

**NOTES:**

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'–0" LINEAR CLEARANCE BETWEEN NATURAL CLAY BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.

3 / E–7 **EGR TRENCH/BACKFILL DETAIL**
NOT TO SCALE



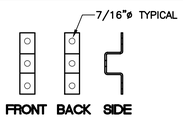

**TYPICAL GROUND BAR ASSEMBLY**
N.T.S.




**TYPICAL GROUND BAR – DIMENSIONS**
N.T.S.

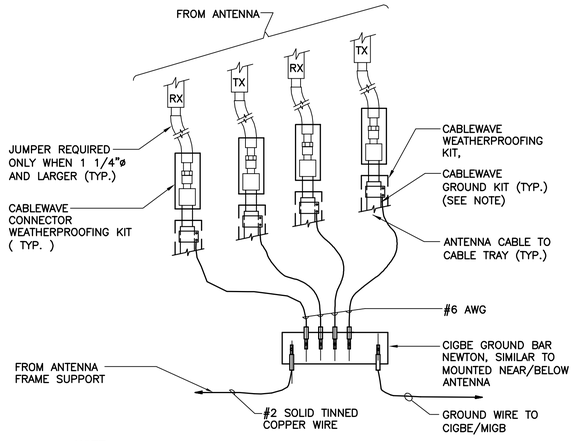
**NOTES**

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'–8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872–1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.




**BRACKET FOR GROUND BAR-DIMENSIONS**
N.T.S.

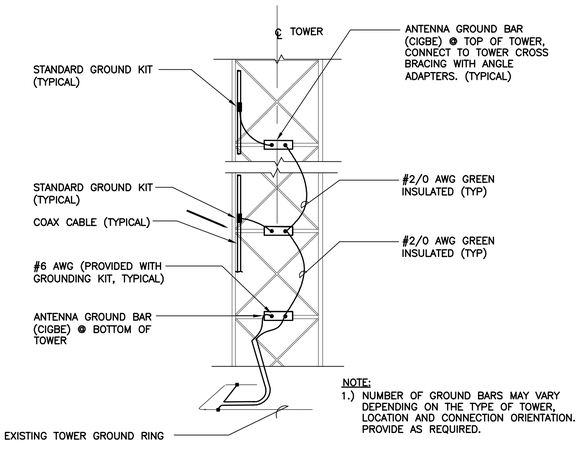
4 / E–7 **MASTER/EQUIPMENT GROUND BAR DETAILS**
N.T.S.




**NOTE:**

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

5 / E–7 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE




NOTE:
1.) NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

6 / E–7 **ANTENNA CABLE GROUNDING – LATTICE TOWER**
NOT TO SCALE

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
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ELECTRICAL DETAILS

**E-7**

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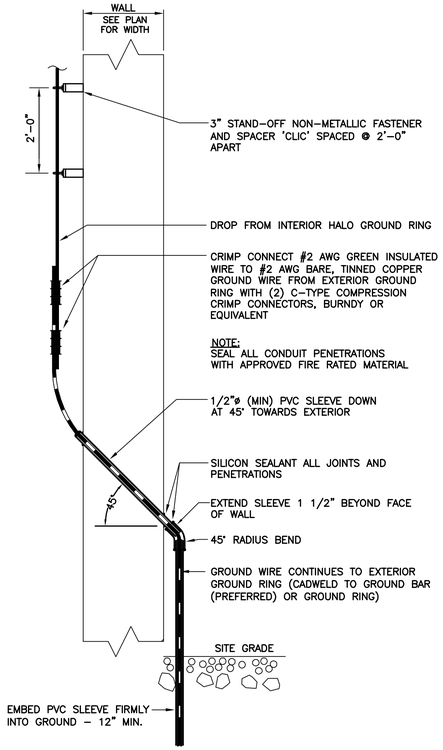
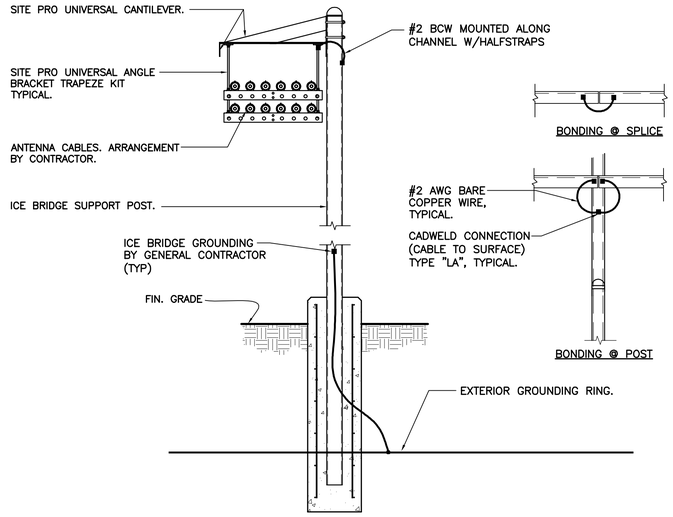
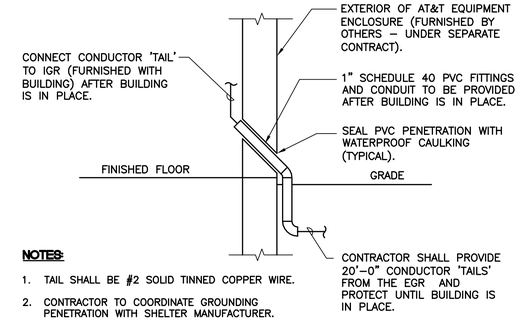



1 E-8 **CELLULAR GROUNDING CONDUCTOR SECURED ON WALL**
N.T.S.

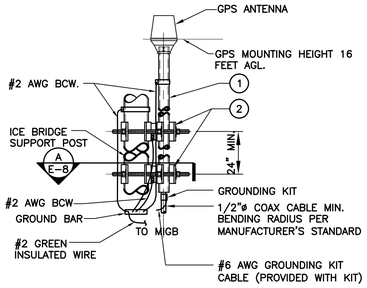



2 E-8 **ICE BRIDGE BONDING DETAIL**
NOT TO SCALE

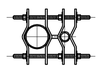



**NOTES:**
1. TAIL SHALL BE #2 SOLID TINNED COPPER WIRE.
2. CONTRACTOR TO COORDINATE GROUNDING PENETRATION WITH SHELTER MANUFACTURER.

3 E-8 **TYPICAL EXTERIOR/INTERIOR GROUNDING CONNECTION**
NOT TO SCALE




GPS ANTENNA MOUNTING BRACKET



A E-8 **SECTION**
NOT TO SCALE

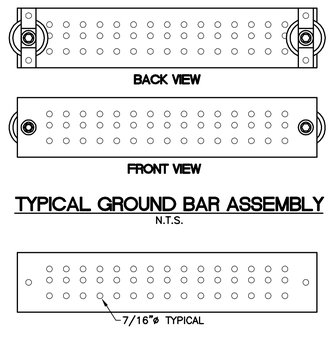
## NOTES

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.

## BILL OF MATERIALS

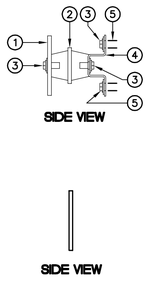
| ITEM | DESCRIPTION | QUANTITY |
|---|---|---|
| 1 | 2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE | 1 |
| 2 | UNIVERSAL CLAMP SET. | 2 |

4 E-8 **GPS GROUNDING/MOUNTING BRACKET DETAIL**
NOT TO SCALE

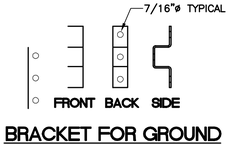



**TYPICAL GROUND BAR ASSEMBLY**
N.T.S.

**TYPICAL GROUND BAR - DIMENSIONS**
N.T.S.

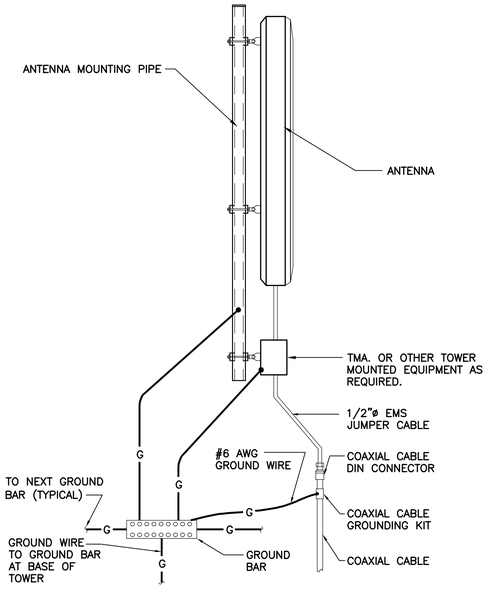



**NOTES:**
1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET
5. STAINLESS STEEL TYPE 304 HARDWARE - 3/8"ø EXPANSION BOLT FOR CONCRETE




**BRACKET FOR GROUND BAR-DIMENSIONS**
N.T.S.

5 E-8 **MASTER/EQUIPMENT GROUND BAR DETAILS**
N.T.S.




6 E-8 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE

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ELECTRICAL DETAILS

**E-8**

Sheet No. 16 of 17

# ELECTRICAL SPECIFICATIONS

## SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL NEW 6-GANG MULTI METER CENTER, 800A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
3. GENERATOR/TRANSFER SWITCH.
4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.
5. POWER AND TEMPERATURE CONTROL WIRING FOR HVAC EQUIPMENT.
   a. FURNISH AND INSTALL ALL POWER WIRING FOR ALL HEATING, VENTILATING, AIR CONDITIONING, MOTORS AND DEVICES, AND FIRE PROTECTION EQUIPMENT INDICATED ON THE PLANS OR CALLED FOR IN THIS SPECIFICATION, EITHER ELECTRICAL OR MECHANICAL INCLUDING ALL CONTROL WIRING. ALL MAGNETIC STARTERS SHALL BE FURNISHED UNDER DIVISION 15 AND HAVE INSTALLED THEREIN A PROPER OVERLOAD HEATER FOR EACH MOTOR.
   b. ALL WIRING, BOTH POWER AND CONTROL, FOR SUCH ITEMS AS UNIT HEATERS, EXHAUST FANS, ETC., NOT SPECIFICALLY CALLED FOR IN THE TEMPERATURE CONTROL SPECIFICATIONS, SHALL BE WIRED UNDER DIVISION 16.
   c. ALL CONTROLS WHICH ARE TO BE WIRED BY THIS CONTRACTOR SHALL BE DELIVERED TO HIM BY THE CONTRACTOR/VENDOR FURNISHING THEM.
6. CELLULAR SITE ALARMS, ASSOCIATED WIRING AND DEVICES.
7. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.
8. FURNISH AND INSTALL 3/4" PLYWOOD BACKBOARD OF SIZE INDICATED ON DRAWINGS FOR MOUNTING OF POWER/SERVICE EQUIPMENT AND TELEPHONE/ALARM EQUIPMENT. BACKBOARDS SHALL BE PAINTED WITH TWO (2) COATS OF SEMI-GLOSS GRAY FIRE RETARDANT PAINT.
9. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
10. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.
2. SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

E. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

## SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". ALL CONDUIT RUNS LOCATED WITHIN THE OWNER'S EQUIPMENT ROOM SHALL ORIGINATE FROM THE WIREWAY AND RUN VERTICALLY TO ITS DESTINATION. NO BENDS WILL BE ACCEPTED. CONDUITS SHALL BE PROPERLY FASTENED TO THE WALLS AND CEILINGS AS REQUIRED BY THE N.E.C.

CONDUIT MATERIAL SHALL BE AS FOLLOWS:

1. ELECTRIC METALLIC TUBING (EMT) – BRANCH CIRCUITS INSIDE WIRELESS ROOM
2. GALVANIZED RIGID CONDUIT (GRC) – FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.
3. LIQUID TIGHT FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.
4. FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.
5. PVC CONDUIT – WHERE SHOWN ON GROUNDING DETAILS.

## SECTION 16114

1.01. CABLE TRAY

A. CABLE TRAY SHALL BE SOLID SIDE BAR, 18" WIDE (NEWTON INSTRUMENT COMPANY, INC.). TRAY SHALL BE INSTALLED AS SHOWN ON CONTRACT DOCUMENTS.

B. CROSSWISE RUNS SHALL BE COORDINATED WITH THE SPECIFIC EQUIPMENT THE TRAY SHALL SERVE.

C. ALL PROTRUDING CABLE TRAY SUPPORT RODS SHALL BE FILED SMOOTH WITH NO SHARP EDGES. ALL SUPPORT RODS SHALL BE CAD-PLATED FOR RUST RESISTANCE AND A MINIMUM 1/2" DIAMETER.

## SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

| | 120/208/240V | 277/480V |
|---|---|---|
| LINE | COLOR | COLOR |
| A | BLACK | BROWN |
| B | RED | ORANGE |
| C | BLUE | YELLOW |
| N | CONTINUOUS WHITE | GREY |
| G | CONTINUOUS GREEN | GREEN WITH YELLOW STRIPE |

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

## SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

## SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

## SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

## SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

## SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

F. PROVIDE A NAMEPLATE AT THE SERVICE EQUIPMENT INDICATING THE TYPE AND LOCATION OF THE ON SITE GENERATOR.

## SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.
4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. INTERIOR GROUND RING
3. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
4. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

## SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

## SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

## SECTION 16700

1.01. BUILDING ALARMS (SIGNAL COMMUNICATIONS)

A. ALARM BOX SHALL BE 12" W x 12" H x 6" D NEMA 1 ENCLOSURE, MCKINSTRY #30-1216LP WITH ACCESSORIES:

- "T" HANDLE LATCH KIT
- 14 GAUGE STEEL PANEL, PAINTED WHITE ENAMEL
- (6) 1/2"-3/4" K.OS ON EACH SIDE/TOP/BOTTOM WALLS
- (2) 3/4" RUBBER GROMMETS AS SLEEVES
- PROVIDE WIRING SCHEMATIC IN REMOVABLE PLASTIC COVER, TAPED TO BACK SIDE OF HINGED DOOR.

B. ALARM SENSORS' RELAY SHALL BE NORMALLY CLOSED. UPON ALARM CONDITION, THE RELAY SHALL REVERSE STATE TO OPEN. CONFIRM INSTALLATION AND LOCATION REQUIREMENTS FOR BUILDING'S ALARM SENSORS.

ALARM SENSORS SHALL BE:

1. FIRE ALARM CONTROL PANEL: FROM C CONTACT RELAY.
2. DOOR CONTACT SENSOR (SENTROL #1085T): SPDT MAGNETIC FORM C CONTACT – OPEN/CLOSE LOOP, MAX 1" GAP.
3. LOW TEMPERATURE SENSOR (HONEYWELL #T631C1103): SPDT AIR SWITCH CONTROLLER – COILED COPPER TUBE IN NEMA 1 ENCLOSURE. SET AT 50 DEGREES F., MOUNT LAMINATED, BACK-LIT NAMEPLATE WITH LEGIBLE DESCRIPTION "LOW TEMP 50 DEGREE F" BELOW SENSOR.
4. HIGH TEMPERATURE SENSOR (HONEYWELL #T631C1103): SPDT AIR SWITCH CONTROLLER – COILED COPPER TUBE IN NEMA 1 ENCLOSURE. SET AT 80 DEGREES F., MOUNT LAMINATED, BACK-LIT NAMEPLATE WITH LEGIBLE DESCRIPTION "HI TEMP 80 DEGREES F" BELOW SENSOR.

C. CONFIRM REQUIREMENTS FOR ALL BUILDING ALARM SENSORS INSTALLATION, AND LOCATION OF EACH SENSOR. ALARM WIRING SHALL BE ROUTED TO ALARM BOX AND SPADE CONNECTED TO RESPECTIVE TERMINAL BLOCK. EACH PAIR OF ALARM WIRING SHALL BE PERMANENTLY AND UNIQUELY TAGGED AT EACH TERMINAL STRIP LOCATION AND AT SPLICE/JUNCTION/BOXES/WIRING TROUGH.

D. REFER TO "WIRING SCHEMATIC FOR ALARM SENSORS" ON DRAWINGS.

## SECTION 16500

1.01. LIGHTING FIXTURES

A. REFER TO LIGHT FIXTURE SCHEDULE FOR REQUIREMENTS.

## SECTION 16620
## (SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

## SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

## SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
| 0 | 11/10/14 | TJB | CKD | CONSTRUCTION – ISSUED FOR CLIENT REVIEW |
| 1 | 11/20/14 | TJB | CKD | CONSTRUCTION |

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications


CENTEK engineering
Centered on Solutions℠
(203) 488-0580
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Branford, CT 06405
www.CentekEng.com


AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
**MERIDEN**
**SITE NUMBER: CT2117**
**200 EDGEMARK ACRES**
**MERIDEN, CT 06451**

DATE: 11/03/14
SCALE: AS NOTED
JOB NO. 13305.000

ELECTRICAL SPECIFICATIONS

E-9

Sheet No. 17 of 17

# ATTACHMENT B

CENTEK engineering

Centered on Solutions℠

# Structural Design of Antenna Frame and Analysis of CL&P Tower

AT&T Mobility Site Ref: CT2117

CL&P Structure No. 783

78' Electric Transmission Lattice Tower

200 Edgemark Acres
Meriden, CT

CENTEK Project No. 13305

~~Date: January 7, 2014~~

Rev 4: October 6, 2014


**Prepared for:**
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

# *Table of Contents*

## *Introduction*

The purpose of this report is to design a proposed antenna mast and analyze the existing 78' CL&P tower located at 200 Edgemark Acres in Meriden, CT for the proposed AT&T Mobility antenna installation.

The proposed loads consist of the following:

- **AT&T MOBILITY (Proposed):**

  **Antennas: Six (6) Andrew CCI HPA-65R-BUU-H8 panel antennas, three (3) Andrew CCI OPA-65R-LCUU-H8 panel antennas and eighteen (18) CCI BPDB7823VG12A TMA's mounted on a Site-Pro Ultra-Low Profile Platform p/n ULP12-496 with a RAD center elevation of 88-ft above grade.**
  **Coax Cables: Thirty-six (36) 1-5/8" ∅ coax cables running on two (2) legs of the existing tower as indicated in section 4 of this report.**

## *Primary assumptions used in the analysis*

- Allowable steel stresses are defined by AISC-ASD 9th edition for design of the ANTENNA Mast and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the CL&P utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed as indicated in Section 4 of this report.
- ANTENNA Mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- ANTENNA Mast and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

## *Analysis*

Structural design of the antenna frame was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc.

The antenna mast consisting of a HSS12.5"x0.625" conforming to ASTM A500 Grade 42 (Fy = 42ksi) mounted on a 18'-6" antenna frame connected at eight points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA/EIA standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the antenna mast in order to obtain reactions needed for analyzing the CL&P tower structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA/EIA loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

An envelope solution was first made to determine maximum and minimum forces, stresses, and deflections to confirm the selected section as adequate. Additional analyses were then made to determine the NESC forces to be applied to the CL&P tower structure.

The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized. The forces calculated in RISA-3D using NESC guidelines were then applied to the CL&P tower using PLS-Tower. Maximum usage for the tower was calculated considering the additional forces from the mast and associated appurtenances.

## *Design Basis*

Our analysis was performed in accordance with EIA-222-F-1996, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

The CL&P tower structure, considering existing and future conductor and shield wire loading, with the proposed antenna mast was analyzed under two conditions:

- UTILITY TOWER ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

  Load cases considered:

  Load Case 1: NESC Heavy
  Wind Pressure…….. 4.0 psf
  Radial Ice Thickness……. 0.5"
  Vertical Overload Capacity Factor……. 1.50
  Wind Overload Capacity Factor……. 2.50
  Wire Tension Overload Capacity Factor…… 1.65

  Load Case 2: NESC Extreme
  Wind Speed…… 110 mph (1)
  Radial Ice Thickness……. 0"

  *Note 1: NESC C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)*

- ANTENNA FRAME ANALYSIS

ANTENNA mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with the NU Design Criteria Table, TIA/EIA-222-F, and AISC-ASD standards.

Load cases considered:

Load Case 1:
Wind Speed……... 85 mph (2)
Radial Ice Thickness…..……. 0”

Load Case 2:
Wind Pressure..…… 75% of 85 mph wind pressure
Radial Ice Thickness…..…….. 0.5”

*Note 2: Per NU Mast Design Criteria Exception 1.*

## *R e s u l t s*

- ANTENNA FRAME ASSEMBLY

The antenna frame was determined to be structurally **adequate**.

| Member | Stress Ratio (% of capacity) | Result |
|---|---|---|
| HSS12.5”x0.625” Mast | 44.2% | **PASS** |
| HSS 6x6x3/8 Brace | 89.0% | **PASS** |
| Mast Connection to CL&P Tower | 81.6% (1) | **PASS** |

Note 1 – 1/3 increase in allowable stress not used for connection to tower per OTRM 059.

- UTILITY TOWER

This analysis finds that the subject utility structure is adequate to support the existing ANTENNA mast and related appurtenances. The tower stresses meet the requirements set forth by the ASCE Manual No. 10-97, “Design of Latticed Steel Transmission Structures”, for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

**With the proposed tower reinforcements detailed in Section 4 of this report** a maximum usage of **96.54%** occurs in the utility tower under the **NESC Extreme** loading condition.

TOWER SECTION:

The utility structure **with the proposed tower reinforcements detailed in Section 4 of this report** was found to be within allowable limits.

| Tower Member | Stress Ratio (% of capacity) | Result |
|---|---|---|
| Angle Leg13X | 96.54% | **PASS** |

- FOUNDATION AND ANCHORS

The existing foundation consists of four (4) 16-inx25-in tapering to 28-inx25-in x 6.25-ft long reinforced concrete piers on four (4) 4-ft-6-in square x 2-ft thick reinforced concrete pads. The base of the tower is connected to the foundation by one (1) anchor stub per leg. Foundation information was obtained from a foundation exploration conducted on May 5, 2014.

BASE REACTIONS:

From PLS-Tower analysis of CL&P tower based on NESC/NU prescribed loads.

| Load Case | Shear | Uplift | Compression |
|---|---|---|---|
| NESC Heavy Wind | 25.29 kips | 26.19 kips | 80.81 kips |
| NESC Extreme Wind | 60.66 kips | 1113.12 kips | 130.05 kips |

Note 1 – 10% increase to be applied to the above tower base reactions for foundation verification per OTRM 051
Note 1 – Reactions are combined leg reactions.

FOUNDATION:

The foundation **with the proposed reinforcements detailed in Section 4 of this report** was found to be within allowable limits.

| Foundation | Design Limit | Allowable Limit | Proposed Loading (2) | Result |
|---|---|---|---|---|
| Reinforced Conc. Pad and Pier | Overturning | 1.0 FS (1) | 1.66 FS (1) | **PASS** |

*Note 1: FS denotes Factor of Safety*
*Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.*

## *Conclusions and Recommendations*

This analysis shows that the subject utility tower **with the proposed reinforcements outlined below and detailed in Section 4 of this report <u>is adequate</u>** to support the proposed AT&T equipment installaiton.

- Replacement of sixteen (8) L1-3/4x1-3/4x3/16 diagonal members with L2x2x5/16.
- Replacement of two (2) L2x2x3/16 horizontal members with L2x2x1/4.
- Installation of one (1) 27'x27'x3.5' reinforced concrete mat.

The analysis is based, in part on the information provided to this office by Northeast Utilities and AT&T Mobility. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

# ATTACHMENT C

**New Cingular Wireless PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut
06067

**Radu Alecsandru**
RF Engineer
at&t mobility

| Transmission Mode | 00000 Centerline Ht (feet) | Frequency (MHz) | 00000000 Number of Channels | Power Per Channel (Watts) | Power Density ($mW/cm^2$) | Standard Limits ($mW/cm^2$) | Percent of Limit |
|---|---|---|---|---|---|---|---|
| AT&T UMTS | 88 | 800 Band | 2 | 500 | 0.0464 | 0.5867 | 7.91 |
| AT&T UMTS | 88 | 1900 Band | 1 | 500 | 0.0232 | 1.0000 | 2.32 |
| AT&T LTE | 88 | 700 Band | 1 | 500 | 0.0232 | 0.4667 | 4.97 |
| AT&T LTE | 88 | 1900 Band | 1 | 500 | 0.0232 | 1.0000 | 2.32 |
| AT&T LTE | 88 | 2300 Band | 1 | 500 | 0.0232 | 1.0000 | 2.32 |
| **Total** | | | | | | | **19.9%** |

# ATTACHMENT D

# Visibility Analysis

CTSR2117
MERIDEN
CL&P UTILITY STRUCTURE NO. 783
200 EDGEMARK ACRES
MERIDEN, CT 06451

*Prepared in February 2014 by:*
All-Points Technology Corporation, P.C.
3 Saddlebrook Drive
Killingworth, CT 06141

New Cingular Wireless PCS, LLC dba AT&T

ALL-POINTS
TECHNOLOGY CORPORATION

## *DOCUMENTATION*

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| 1 | **EDGEMARK ACRES (24mm Focal Length)** | **EAST** | **+/- 0.04 MILE** |

ALL-POINTS TECHNOLOGY CORPORATION

at&t

***SIMULATION***

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **1** | **EDGEMARK ACRES (24mm Focal Length)** | **EAST** | **+/- 0.04 MILE** |

ALL-POINTS TECHNOLOGY CORPORATION

at&t

***DOCUMENTATION***

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **2** | **RIVERSIDE DRIVE** | **NORTHEAST** | **+/- 0.08 MILE** |

ALL-POINTS TECHNOLOGY CORPORATION

at&t

***SIMULATION***

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **2** | **RIVERSIDE DRIVE** | **NORTHEAST** | **+/- 0.08 MILE** |

ALL-POINTS TECHNOLOGY CORPORATION

at&t

## *DOCUMENTATION*

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **3** | **OLD GATE ROAD** | **SOUTHEAST** | **+/- 0.29 MILE** |

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***SIMULATION***

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **3** | **OLD GATE ROAD** | **SOUTHEAST** | **+/- 0.29 MILE** |

ALL-POINTS TECHNOLOGY CORPORATION

at&t

***SIMULATION***

| PHOTO | LOCATION | ORIENTATION | DISTANCE TO SITE |
|---|---|---|---|
| **3** | **OLD GATE ROAD** | **SOUTHEAST** | **+/- 0.29 MILE** |

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# ATTACHMENT E

# TOWAIR Determination Results

HELP

New Search Printable Page

## *** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

| **DETERMINATION Results** | |
|---|---|
| **Structure does not require registration. The structure meets the 6.10-meter (20-foot) Rule criteria.** | |
| **Your Specifications** | |
| **NAD83 Coordinates** | |
| Latitude | 41-31-51.7 north |
| Longitude | 072-50-33.7 west |
| **Measurements (Meters)** | |
| Overall Structure Height (AGL) | 28 |
| Support Structure Height (AGL) | 24.4 |
| Site Elevation (AMSL) | 109.7 |
| **Structure Type** | |
| UPOLE - Utility Pole/Tower used to provide service (Electric, Telephone, etc) | |

**Tower Construction Notifications**
Notify Tribes and Historic Preservation Officers of your plans to build a tower.

# AIRSPACE®

## Federal Aviation Regulations Part 77 Sub-Part C
## Obstruction Analysis Report

New Cingular Wireless PCS
David A Vivian
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

E-mail: David.Vivian@SAI-Comm.com
Phone: 4132185042 Fax:2079678436

**Site Identification:** 200_EDGEMARK_ACRES
**Nearest City:** Meriden, CT

Site Information (Coordinate Datum - NAD83)

| | | |
|---|---|---|
| **Latitude:** | 41° - 31' - 51.74" | **Decimal Degrees:** 41.5310388888889° |
| **Longitude:** | 72° - 50' - 33.65" | **Decimal Degrees:** 72.8426805555555° |

| | |
|---|---|
| **Ground Elevation:** | 360 feet AMSL |
| **Structure Height:** | 93 feet AGL |
| **Overall Height:** | 453 feet AMSL |

**FAA Number:** Null
**Airspace Study #:** 2013-APS-1276-OE

Analyzed on: 12/6/2013. Using Airspace® 13.11.211. Airspace® Data Date: 11/15/2013

This Airspace Analysis was completed under all obstacle evaluation rules specified in Federal Aviation Regulations (FAR) Part 77 sub-Part C.

Approved,

Justin J Pittman, Airspace Specialist
Federal Airways & Airspace®
1423 S. Patrick Dr
Satellite Beach, FL 32937
(321)777-1266

Clyde J Pittman, Aerospace Engineeer

Date Printed: 12-02-2013

# AIRSPACE®

**Site ID Number:** 200_EDGEMARK_ACRES

## AERONAUTICAL RECOMMENDATIONS

Notice to the FAA is not required for the proposed antenna which will increase the height of an existing structure by less than 20 feet. This exemption is described in CFR Part 77.9(e)(4).

TERPS® analysis has been completed for the proposed site. The maximum allowable height identified is 487 feet AMSL based upon MMK RWY 18 Depature ICA.

The height of the existing structure will exceed obstruction standards. The FAA would require an extended study to determine the aeronautical impacts. The maximum not to exceed height to avoid an extended study by the FAA is 253 feet AMSL.

Marking and Lighting are not normally required for structures 200 feet or less. However, it may become a requirement based upon the outcome of the aeronautical study conducted by the FAA. It will then become part of the determination and a requirement of the determination.

No adverse impact to low altitude federal airways are identified.

Possible VFR Traffic Pattern operations impact.

No Potential FCC Licensed AM Broadcast Station interference identified.

No impact to an Air Navigation Facility has been identified.

Executive Summary

This study evaluated a proposed antenna tower which would be located upon an existing T-L utility structure that would increase the overall height of the existing structure by no more than 15 feet. Title 14 CFR Part 77.9(e)(4) exempts the requirement for notice of the proposed antenna to the FAA,

> "Any antenna structure of 20 feet or less in height except one that would increase the height of another antenna structure."

The existing structure does exceed obstruction standards by exceeding the IFR horizontal and VFR conical surfaces. The existing structure does not exceed any instrument or departure procedure. If the existing T-L structure was to be submitted to the FAA, the structure would likely be approved with the condition of marking and/or lighting. Application of 77.9(e)(4) would except the proposed antenna tower from requiring notice to the FAA.

Information has also been provided by the Client that the existing T-L structure is located less than 150 feet from another existing T-L structure that is of greater height and obstruction lighted. AC70/7460-1K Paragraph 55, "Group of Obstructions," provides guidance for structures grouped together.

> "When individual objects, except wind turbines, within a group of obstructions are not the same height

Date Printed: 12-02-2013

# AIRSPACE®

**Site ID Number:** 200_EDGEMARK_ACRES

## LANDING FACILITY INFORMATION

The nearest public use landing facility to the proposed location is:
MERIDEN MARKHA (Ident: MMK)

The distance to the nearest runway of this landing facility is 33244 feet or 6.3 statute miles. The true bearing is 156.08° to this landing facility.

Private landing facilities are exempt from review by the FAA under FAR Part 77. However, locating near a private landing facility may affect aircraft operations during take-off and landing.

The nearest private landing facility is: ME87: GOOD
The existing structure is located 11119 feet or 2.1 statute miles.
The true bearing to this landing facility is 116 degrees.

The existing structure is within 3 nautical miles (3.45 statute miles) of a private landing facility. This landing facility and supporters are likely to resist this proposal during the local zoning board hearing.

## FAA NOTICE REQUIREMENTS

Notice to the FAA would be required for the following reasons listed below unless

proposed tower meets one or more exemption criteria described within CFR

The existing structure exceeds a slope begining at the runway and extending towards the existing structure. The airport runway elevation, the structure's total elevation above mean sea level (AMSL), the distance between the runway and the existing structure and the airport slope (100:1 or 50:1) are the factors considered during the calculations. This requirement is specified in FAR Part 77.9(b). The maximum height permitted by this FAR is 1832 feet AMSL.

The proposed antenna tower meets the exemption criteria described in CFR Part 77.9(e)(4) and does not require notice to the FAA.

Date Printed: 12-02-2013

# AIRSPACE®

**Site ID Number:** 200_EDGEMARK_ACRES

## AERONAUTICAL IMPACT

FAR Part 77 Subpart-C Obstruction Standards

The height of the existing structure will exceed obstruction standards as defined by FAR Part 77.17(a)(1), 77.17(a)(2) or 77.19.
.

Terminal Instrument Procedure Standards - FAR Part 77.17(a)(3)

No adverse impact with a US Terminal Approach or Departure Procedure has been identified.

Minimum Obstacle Clearance Altitude (MOCA) - FAR Part 77.17(a)(4)

The proposed structure is not located within a low altitude airway area and will not impact aircraft using any airway.

VFR Traffic Pattern Airspace

The proposed structure is located within a VFR Traffic Pattern Airspace. The maximum allowable height is 361 ft AMSL based upon the VFR Conical Surface.

FCC Licensed AM Broadcast Station Proof-of-Performance

The proposed structure is not located within the specified range of an FCC Licensed AM radio and will not require Proof-of-Performance analysis.

Date Printed: 12-02-2013

**********
* Federal Airways & Airspace *
* Summary Report: Alteration Of Existing Structure *
* Non-Antenna Structure *
**********

Airspace User: Justin Pittman

File: 200_EDGEMARK_ACRES

Location: Meriden, CT
Distance: 2.5 Statute Miles
Direction: 81° (true bearing)

Latitude: 41°-31'-51.74" Longitude: 72°-50'-33.65"

SITE ELEVATION AMSL.....360 ft.
STRUCTURE HEIGHT..... 93 ft.
OVERALL HEIGHT AMSL.....453 ft.

NOTICE CRITERIA
FAR 77.9(a): NNR (DNE 200 ft AGL)
FAR 77.9(b): NR (Exceeds Notice Slope, Maximum: 250 ft.)
FAR 77.9(c): NNR (Not a Traverse Way)
FAR 77.9: NNR FAR 77.9 IFR Straight-In Notice Criteria for MMK
FAR 77.9: NNR FAR 77.9 IFR Straight-In Notice Criteria for 4B8
FAR 77.9(d): NNR (Off Airport Construction)

NR = Notice Required
NNR = Notice Not Required
PNR = Possible Notice Required (depends upon actual IFR procedure)
For new construction review Air Navigation Facilities at bottom of this report.

If the proposed construction is an alteration to an existing structure, notice requirements may be superceded by the item exemptions listed below.

The location and analysis were based upon an existing structure. However, no existing aeronautical study number was identified. **If the 'existing' structure penetrates an obstruction surface defined by CFR 77.17, 77.19, 77.21 or 77.23 (see below) it is recommended the FAA be notified of the 'existing' structure to determine obstruction marking or lighting requirements.** It is not uncommon for the FAA to issue a Determination of No Hazard (DNH) for an existing structure and modify the airspace to accommodate the structure, should that be required. If the FAA issues a DNH enter the aeronautical study number (ASN) in the space provided on the Airspace Analysis Window Form and re-run Airspace.

The FAA Co-Location policy does not apply unless the existing structure has been previously studied by the FAA and has a valid ASN with a DNH ruling. To take advantage of co-locating an antenna systems on an 'existing' structure it is recommended that 'only' notice on the existing structure be filed with the FAA. Once the DNH is received rerun Airspace and enter the ASN is the space provided.

Title 14 CFR Part 77.9(e), Notice Criteria Exception:
The location and analysis were based upon an existing structure with the alteration limited to the addition of an antenna with a height no greater than 20 feet. **Title 14 CFR Part 77.9(e)(4) exempts the requirement for notice to the FAA; "Any antenna structure of 20 feet or less in height except one that would increase the height of another antenna structure." If the addition**

**of an antenna of 20 feet or less to an existing structure increase the height of the structure to exceed 200 feet AGL or penetrate an obstruction surface defined by Title 14 CFR 77.17, 77.19, 77.21 or 77.23 notice is recommend**. This will allow the FAA to determine the level of obstruction lighting required and any aeronautical impacts, if any, to aircraft operations. Notice of an existing structure almost always receives a No Hazard Determination. Please see Summary Report below plus the Airport and Part 77 Reports for application of the above listed CFRs.

OBSTRUCTION STANDARDS
FAR 77.17(a)(1): DNE 499 ft AGL
FAR 77.17(a)(2): DNE - Airport Surface
FAR 77.19(a): Exceeds - Horizontal Surface Maximum 253 ft AMSL
FAR 77.19(b): DNE - Conical Surface
FAR 77.19(c): DNE - Primary Surface
FAR 77.19(d): DNE - Approach Surface
FAR 77.19(e): DNE - Transitional Surface

VFR TRAFFIC PATTERN AIRSPACE FOR: MMK: MERIDEN MARKHAM MUNI
Type: A RD: 7360.773 RE: 103
FAR 77.17(a)(1): DNE
FAR 77.17(a)(2): Does Not Apply.
VFR Horizontal Surface: DNE
VFR Conical Surface: Exceeds - Maximum allowable height is 361 ft AMSL.
VFR Approach Slope: DNE
VFR Transitional Slope: DNE

The structure is within VFR - Traffic Pattern Airspace Climb/Descent Area. Structures exceeding the greater of 350' AAE, 77.17(a)(2), or VFR horizontal and conical surfaces will receive a hazard determination from the FAA. Maximum AMSL of Climb/Descent Area is 453 feet.

VFR TRAFFIC PATTERN AIRSPACE FOR: 4B8: ROBERTSON FIELD
Type: A RD: 56198.98 RE: 200
FAR 77.17(a)(1): DNE
FAR 77.17(a)(2): DNE - Greater Than 5.99 NM.
VFR Horizontal Surface: DNE
VFR Conical Surface: DNE
VFR Approach Slope: DNE
VFR Transitional Slope: DNE

TERPS DEPARTURE PROCEDURE (FAA Order 8260.3, Volume 4)
FAR 77.17(a)(3) Departure Surface Criteria (40:1)
The Maximum Height Permitted is 287 ft AMSL

MINIMUM OBSTACLE CLEARANCE ALTITUDE (MOCA)
FAR 77.17(a)(4) MOCA Altitude Enroute Criteria
The Maximum Height Permitted is 1500 ft AMSL

PRIVATE LANDING FACILITIES

| FACIL IDENT | TYP | NAME | BEARING To FACIL | RANGE IN NM | DELTA ARP ELEVATION | FAA IFR |
|---|---|---|---|---|---|---|
| CT95 | HEL | MERIDEN-WALLINGFORD HOSPITAL | 84.7 | 1.49 | +308 | |

No Impact to Private Landing Facility
Structure is beyond notice limit by 4053 feet.

| | | | | | | |
|---|---|---|---|---|---|---|
| CT21 | HEL | C N FLAGG | 113.25 | 3.54 | +120 | |

No Impact to Private Landing Facility
Structure is beyond notice limit by 16509 feet.

0CT1 HEL BRISTOL-MYERS SQUIBB COMPANY 125.47 4.79 +103
No Impact to Private Landing Facility
Structure is beyond notice limit by 24105 feet.

AIR NAVIGATION ELECTRONIC FACILITIES

| FAC IDNT | TYPE | ST AT | FREQ | VECTOR | DIST (ft) | DELTA ELEVA | ST | LOCATION | GRND ANGLE | APCH BEAR |
|---|---|---|---|---|---|---|---|---|---|---|
| MMK | CO | Y | 134.92 | 152.2 | 7362 | +297 | CT | MERIDEN | 2.31 | |

Notice Required. Unless exempt under FAA/FCC co-location policy or Title 14 CFR Part 77.9(e).

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MAD | VOR/DME | R | 110.4 | 152.5 | 89262 | +233 | CT | MADISON | .15 | |
| HFD | VOR/DME | R | 114.9 | 63.5 | 90183 | -396 | CT | HARTFORD | -.25 | |
| HVN | VOR/DME | R | 109.8 | 186.78 | 98609 | +447 | CT | NEW HAVEN | .26 | |
| BDL | RADAR | ON | | 16.36 | 154800 | +217 | CT | BRADLEY INTL | .08 | |
| BDR | VOR/DME | R | 108.8 | 209.74 | 155560 | +444 | CT | BRIDGEPORT | .16 | |
| QVH | RADAR ARSR | Y | 1326.9 | 169.85 | 241503 | +102 | NY | RIVERHEAD | .02 | |
| OKX | RADAR WXL | Y | | 181.37 | 242553 | +232 | NY | BRENTWOOD | .05 | |

FCC AM PROOF-OF-PERFORMANCE
NOT REQUIRED: Structure is not near a FCC licensed AM radio station Proof-of-Performance is not required. Please review AM Station Report for details.

Nearest AM Station: WMMW @ 4243 meters.

Airspace® Summary Version 13.11.336



12-02-2013
10:11:24

```
*******************************************
*      F.A.R. 77  OBSTRUCTION ANALYSIS      *
*******************************************

Airspace User: Justin Pittman

FILE: 200_EDGEMARK_ACRES

LATITUDE: 41°-31'-51.74"         LONGITUDE: 72°-50'-33.65"

SITE ELEVATION AMSL.....   360 ft.
STRUCTURE HEIGHT.........   93 ft.
OVERALL HEIGHT AMSL.....   453 ft.
```

77.17(a)(1) A height more than 499 ft. Above Ground Level (AGL).

********** DOES NOT EXCEED **********

THE MAXIMUM ALLOWABLE HEIGHT IS:..... 859 ft. AMSL

THE GROUND ELEVATION AT THE SITE IS:... 360 ft. AMSL

THE OVERALL CASE ELEVATION IS:..... 453 ft. AMSL

THE CASE IS BELOW THE ALLOWABLE BY:.... 406 ft.

```
*******************************************
       BEGIN AIRPORT ANALYSIS FOR MMK
*******************************************
```

77.17(a)(2) A height AGL or airport elevation, whichever is higher.

********** DOES NOT EXCEED **********

BECAUSE: Airport does not have a runway longer than 3200 feet.

THE REFERENCE AIRPORT IDENT IS:..... MMK

THE AIRPORT ELEVATION IS:..... 103 ft. AMSL

THE DISTANCE FROM THE CASE TO ARP IS:.. 1.4713 NAUTICAL MILES

THE BEARING AIRPORT TO CASE IS:..... 336.084 DEGREES

THE CASE HEIGHT AGL IS:..... 93 ft.

ALLOWABLE HEIGHT..... 560 ft. AMSL

77.19 (a) A height exceeding a horizontal surface 150 ft. above airport elevation within a radius of >> MMK <<.

******* EXCEEDS HORIZONTAL SURFACE *******

MAXIMUM ALLOWABLE HEIGHT IS:..... 253 ft AMSL.

THE AIRPORT ELEVATION IS:..... 103 ft. AMSL

THE CASE EXCEEDS THE ALLOWABLE BY:.... 200 ft.

77.19(b) A height exceeding a conical surface (a slope outward 4000 ft. from the horizontal surface at 20/1 ratio).

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED CONICAL SURFACE AREA

**********
* BEGIN RUNWAY ANALYSIS *
**********

EXISTING RUNWAY 18/36

77.19(c) A height exceeding runway primary surface.

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED RUNWAY PRIMARY SURFACE

77.19(d) A height exceeding an approach surface of RUNWAY 18.

THE BEARING TO THE CASE FROM THE THRESHOLD IS..... 334.663 degrees

THE ABEAM BEARING TO THE CENTERLINE IS..... 251.68 degrees

THE CENTERLINE OUTBOUND TRUE BEARING IS..... 341.68 degrees

THE ABEAM DISTANCE TO CENTERLINE FROM CASE IS..... 875.1 ft.

THE RUNWAY THRESHOLD ELEVATION IS..... 103 ft. AMSL

THE DISTANCE FROM THRESHOLD + 200' TO THE CASE IS... 7162.231 ft.

THE DISTANCE FROM THRESHOLD + 200' TO NB IS..... 7108.51 ft.

THE CRITICAL WIDTH OF HALF THE APPROACH IS..... 783.135 ft.

THE TRANSITIONAL SURFACE HEIGHT IS 471' AMSL. HOWEVER, THE CASE IS IN AN AREA WHERE THE TRANSITIONAL SURFACE IS LIMITED BY THE HORIZONTAL SURFACE (253' AMSL). See FAR 77.19(a) for this runway.

THE SLOPE OF RUNWAY 18 IS: 20 TO 1.

The FAA has defined this runway as a utility runway. It has a visual approach. The obstacle surface extends 5000 feet (20:1 Slope) symmetrically centered along the runway centerline extended. This airport may have a circling approach. Please review the US Terminal Procedures volume associated with this airport. If a procedure for this airport and/or this runway exist, use Terps® Professional software to determine the height limits (if any) the procedure will have on the proposed structure. A circling approach to the airport or any runway can extend out up to 4.5 NM from every runway end.

**********
BEGIN AIRPORT ANALYSIS FOR 4B8
**********

77.17(a)(2) A height AGL or airport elevation, whichever is higher.

********** DOES NOT EXCEED **********

BECAUSE: Location studied is further than 5.99 NM from ARP.

THE REFERENCE AIRPORT IDENT IS:..... 4B8

THE AIRPORT ELEVATION IS:..... 202 ft. AMSL

THE DISTANCE FROM THE CASE TO ARP IS:.. 9.5512 NAUTICAL MILES

THE BEARING AIRPORT TO CASE IS:..... 174.045 DEGREES

THE CASE HEIGHT AGL IS:..... 93 ft.

ALLOWABLE HEIGHT..... 1215 ft. AMSL

77.19 (a) A height exceeding a horizontal surface 150 ft. above airport elevation within a radius of >> 4B8 <<.

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED HORIZONTAL SURFACE AREA

77.19(b) A height exceeding a conical surface (a slope outward 4000 ft. from the horizontal surface at 20/1 ratio).

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED CONICAL SURFACE AREA

**********
* BEGIN RUNWAY ANALYSIS *
**********

EXISTING RUNWAY 02/20

77.19(c) A height exceeding runway primary surface.

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED RUNWAY PRIMARY SURFACE

77.19(d) A height exceeding an approach surface of RUNWAY 02.

THE BEARING TO THE CASE FROM THE THRESHOLD IS..... 173.64 degrees

THE ABEAM BEARING TO THE CENTERLINE IS..... 95.35 degrees

THE CENTERLINE OUTBOUND TRUE BEARING IS..... 185.35 degrees

THE ABEAM DISTANCE TO CENTERLINE FROM CASE IS..... 11382.2 ft.

********** DOES NOT EXCEED **********

CASE MEETS ANGULAR CRITERIA BUT IS LOCATED GREATER THAN 50,000 ft. FROM THE START OF

ANY APPROACH TYPE, OUT BY 4839.5 feet

**********
* BEGIN RUNWAY ANALYSIS *
**********

PROPOSED RUNWAY 02/20

77.19(c) A height exceeding runway primary surface.

********** DOES NOT EXCEED **********

NOT WITHIN SPECIFIED RUNWAY PRIMARY SURFACE

77.19(d) A height exceeding an approach surface of RUNWAY 02.

THE BEARING TO THE CASE FROM THE THRESHOLD IS..... 173.64 degrees

THE ABEAM BEARING TO THE CENTERLINE IS..... 95.35 degrees

THE CENTERLINE OUTBOUND TRUE BEARING IS..... 185.35 degrees

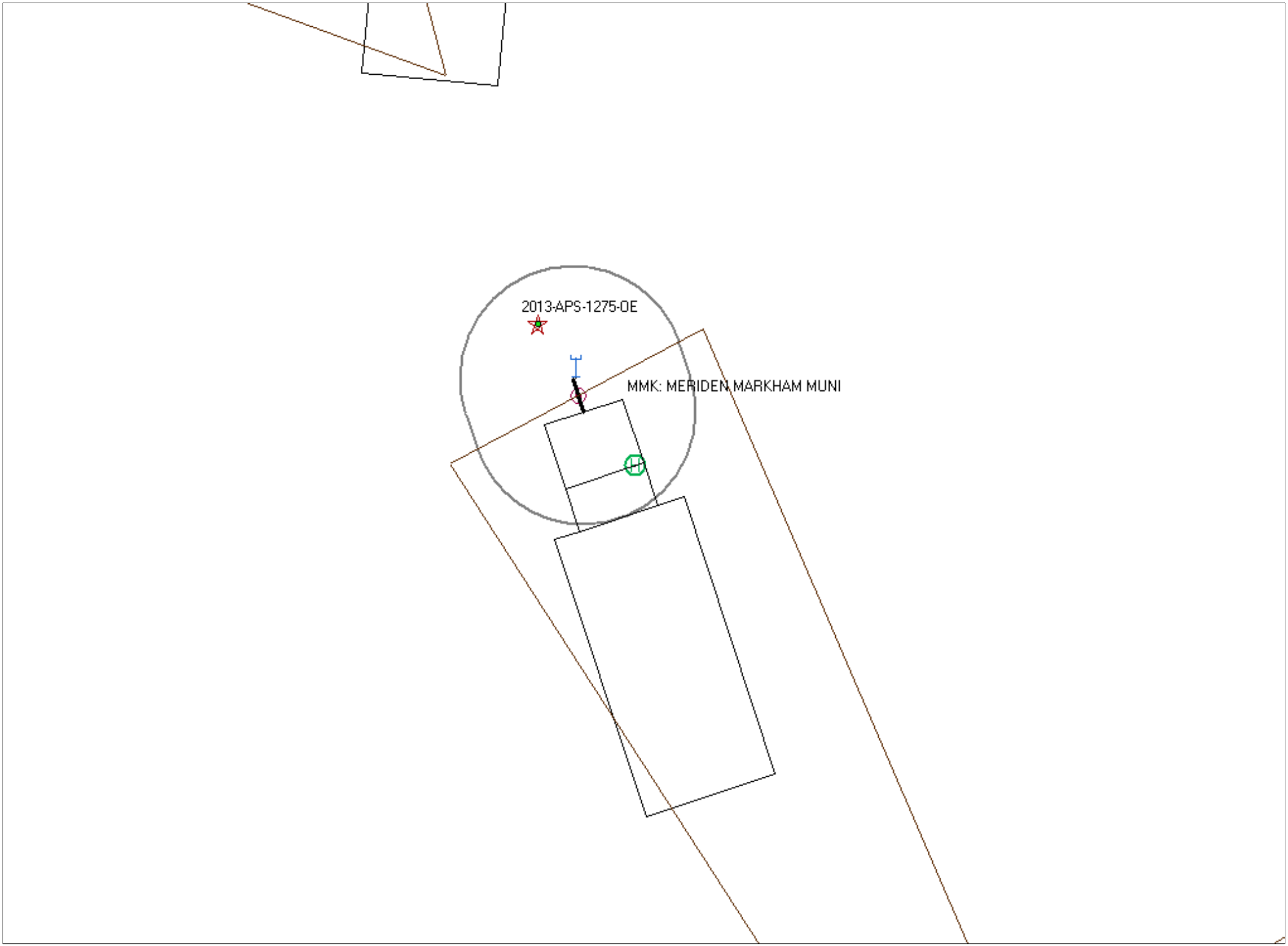
THE ABEAM DISTANCE TO CENTERLINE FROM CASE IS..... 11381.7 ft.

********** DOES NOT EXCEED **********

CASE MEETS ANGULAR CRITERIA BUT IS LOCATED
GREATER THAN 50,000 ft. FROM THE START OF
ANY APPROACH TYPE, OUT BY 4837.4 feet



12-02-2013
10:10:44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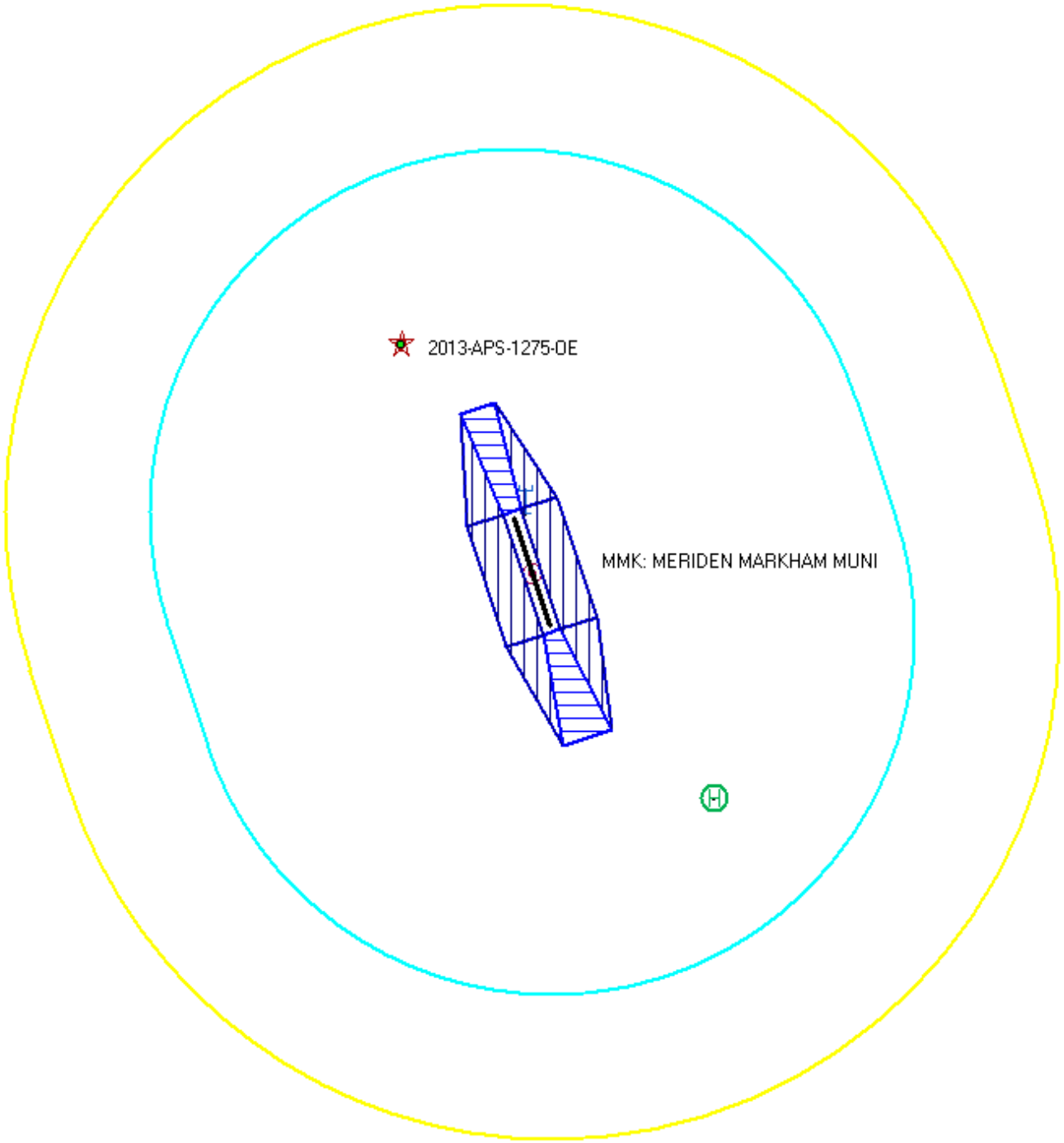
MMK: MERIDEN MARKHAM MUNI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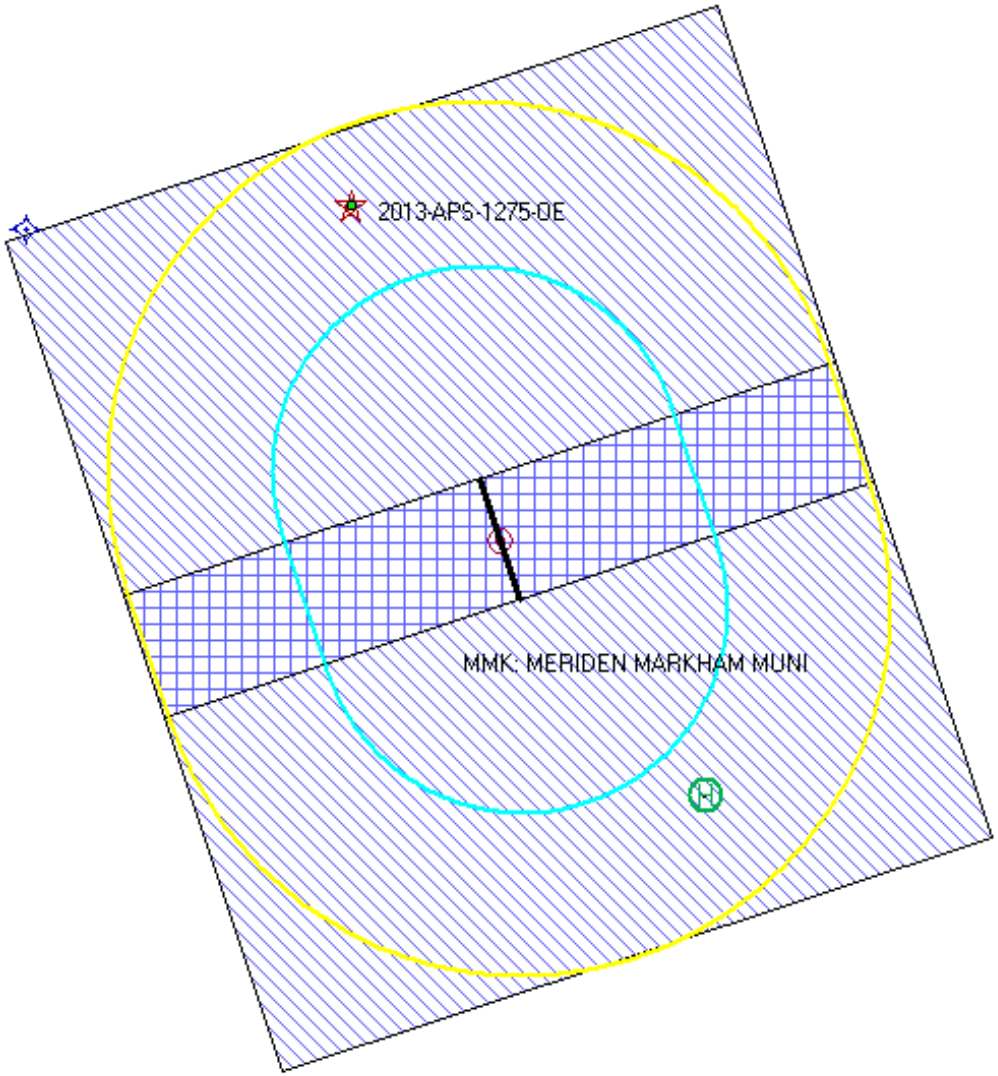
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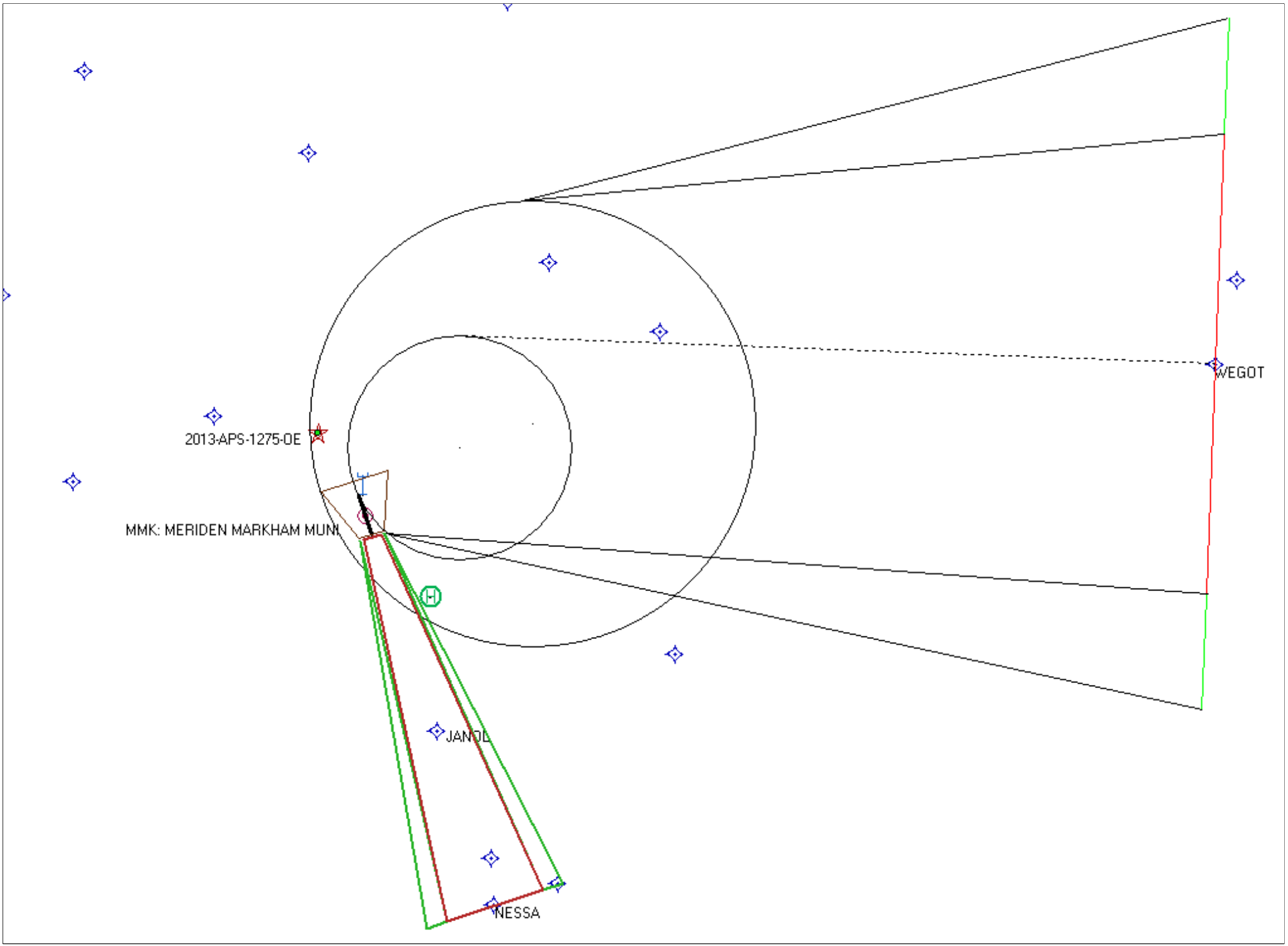
MMK: MERIDEN MARKHAM MUNI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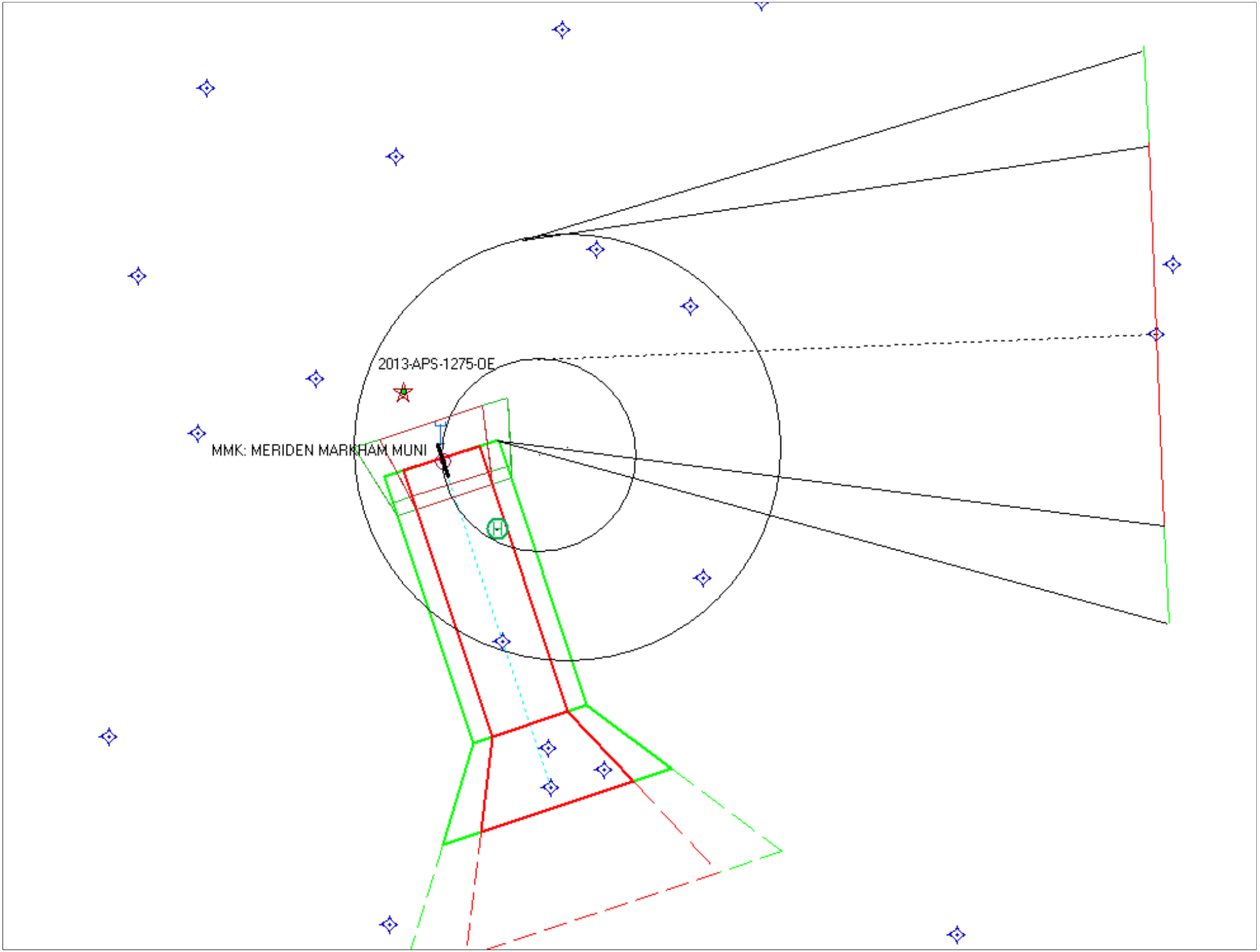
2013-APS-1275-OE
MMK: MERIDEN MARKHAM MUNI
JANOL
NESSA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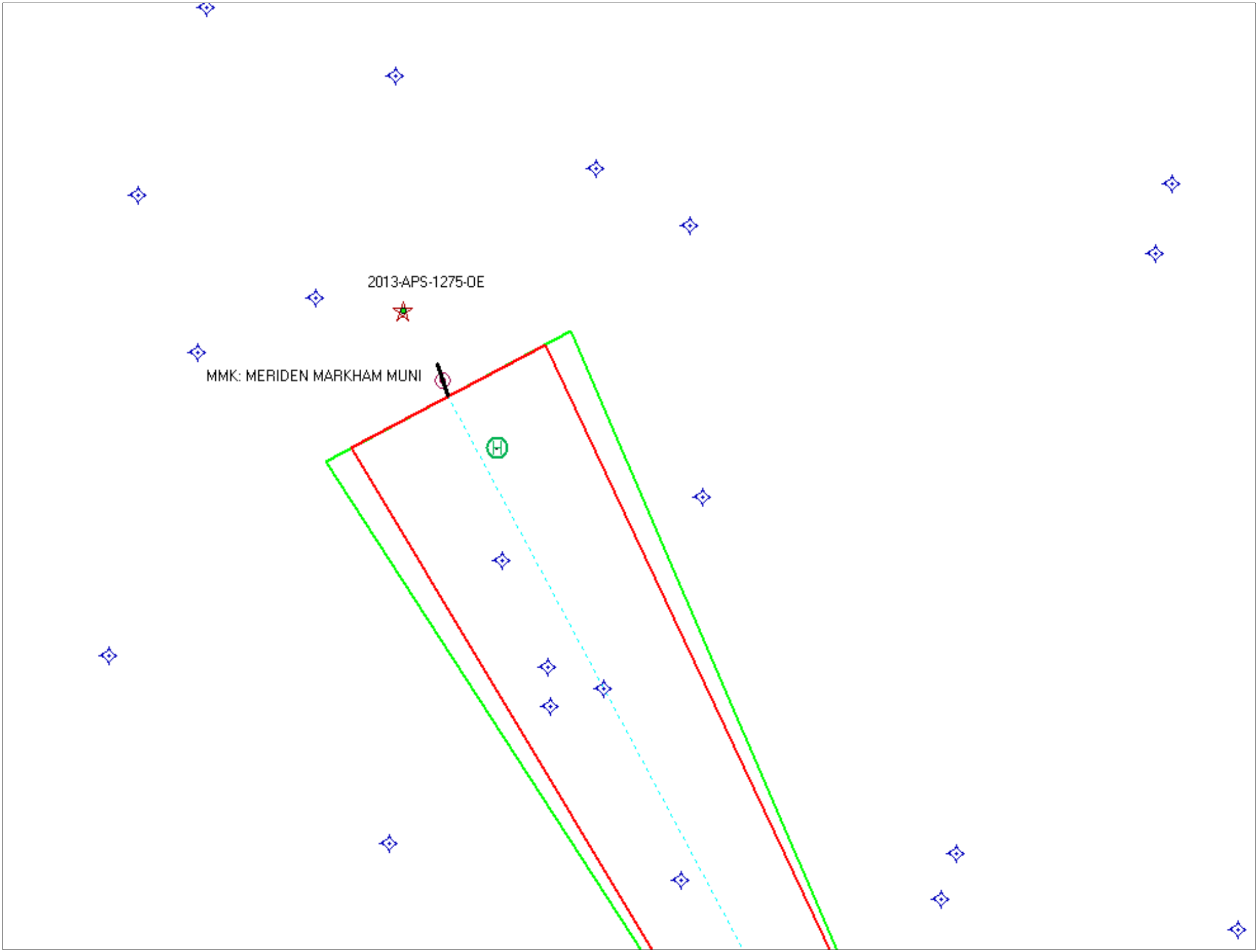
MMK: MERIDEN MARKHAM MUNI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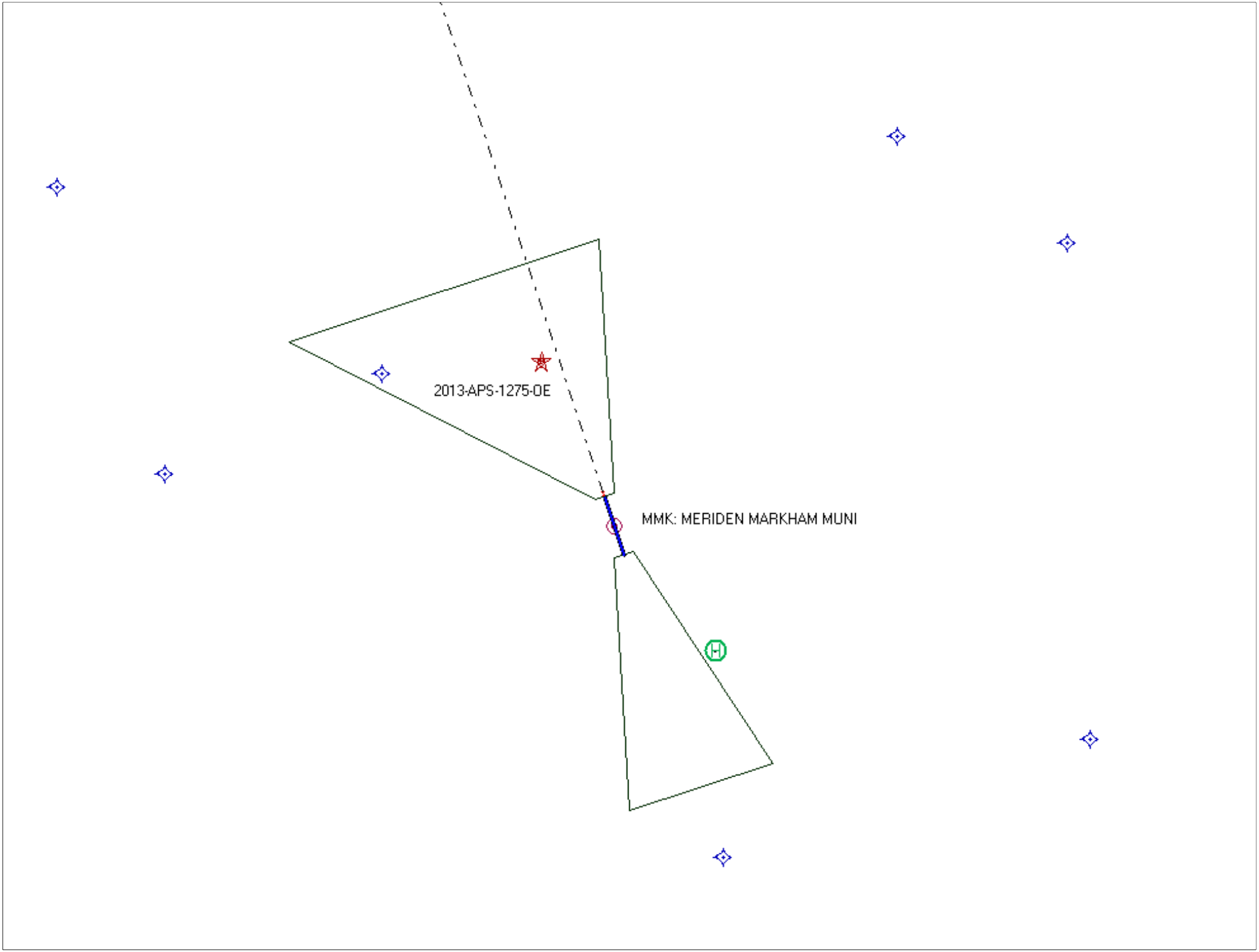
MMK: MERIDEN MARKHAM MUNI


2013-APS-1275-OE
MMK: MERIDEN MARKHAM MUNI

## Departure Runway 36

***** 200_EDGEMARK_ACR *****

**MERIDEN MARKHAM MUNI - Runway: 36**

**Date: 12-02-2013 Time: 09:42:20**

**STUDY OBJECT DATA**

Study Latitude: 41° 31' 51.74" N
Study Longitude: 72° 50' 33.65" W
Ground Elevation: 360' AMSL ft.
AGL Height: 93' AGL ft.
Overall Elevation: 453' AMSL ft.

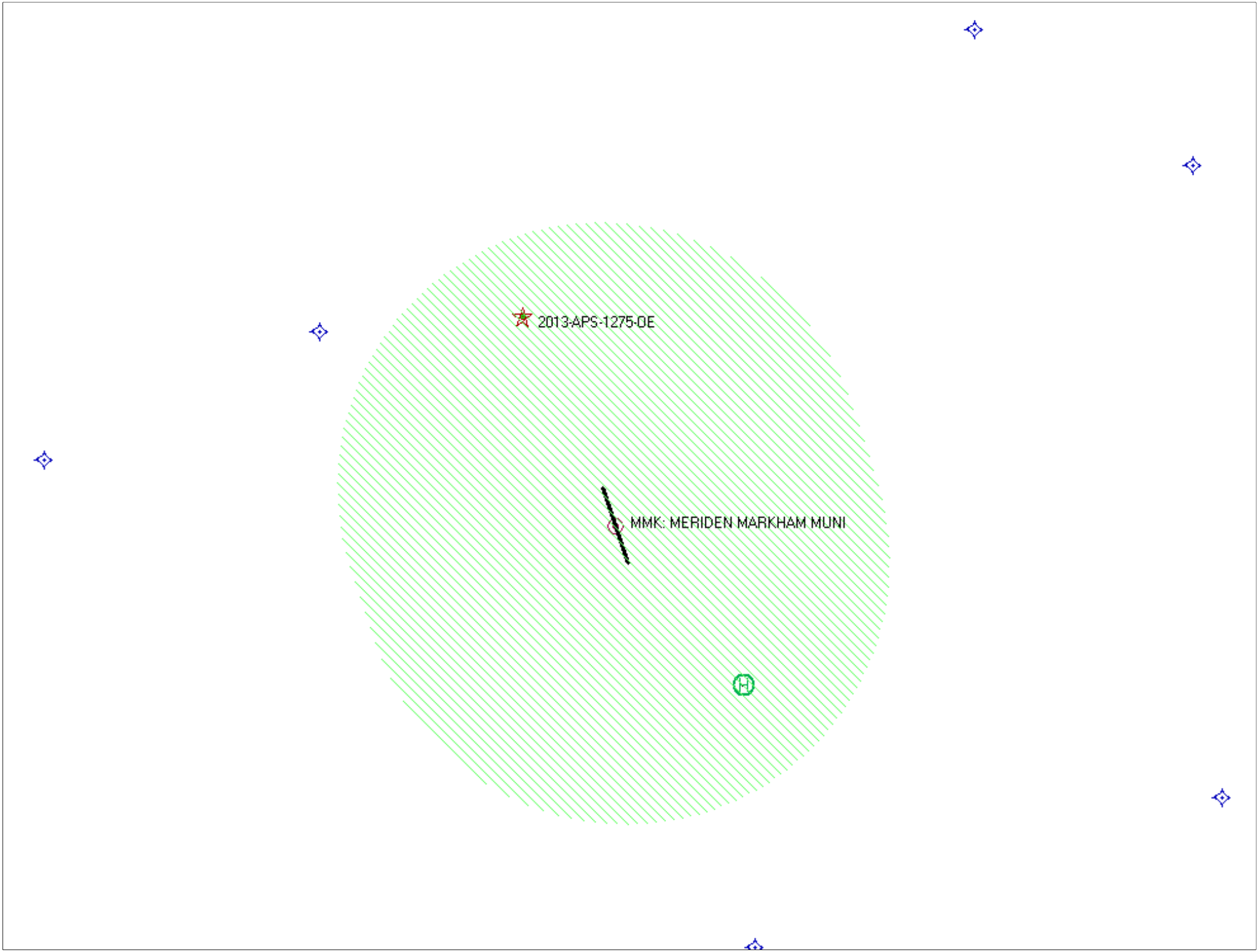
INSTRUMENT DEPARTURE ANALYSIS

Initial Climb Area (ICA): Max Hgt ICA: 487 ft

Diverse Departure A Not in Diverse A - DNE Diverse A

Diverse Departure B Not in Diverse B - DNE Diverse B

The above analysis is in accordance with FAA Order 8260.3B Change 19. This analysis used a 420 ft/NM climb gradient (CG) and an Obstacle Clearance Surface (OCS) that provides 100 feet of obstacle clearance at 1 NM from the Departure End of Runway (DER). Some runways have published climb gradients greater than 200 ft/NM. A specified climb gradient greater than standard (200 ft/NM) is sometimes necessary to allow acceptable obstacle clearance. Should your location exceed the value indicated above you may need to determine if there is a published CG and conduct additional calculations to determine if the CG will provide proper clearance for your proposed structure.


2013-APS-1275-OE
MMK: MERIDEN MARKHAM MUNI

# Circling Approach Area Analysis

***** 200_EDGEMARK_ACR *****

**MERIDEN MARKHAM MUNI**

**Date: 12-02-2013 Time: 09:46:38**

## STUDY OBJECT DATA

| | |
|---|---|
| Study Latitude: | 41° 31' 51.74" N |
| Study Longitude: | 72° 50' 33.65" W |
| Ground Elevation: | 360' AMSL ft. |
| AGL Height: | 93' AGL ft. |
| Overall Elevation: | 453' AMSL ft. |

## INSTRUMENT APPROACH PROCEDURE (IAP) ANALYSIS GPS

| | |
|---|---|
| Distance: | 7361 ft. |
| Aircraft Category: | B |
| Circling MDA: | 780 |
| Vkias: | 120 knots |
| Vktas: | 125.1191 knots |
| Bank Angle: | 25° |
| Straight Segment: | 0.4 NM |
| Expanded CAA: | True |
| Turn Radius: | 1.7 NM |
| Maximum AMSL: | 480 |



The mathematical algorithms used by this program are derived directly from Federal Aviation Administration (FAA) Orders on Instrument Flight Procedures.

# SITE GROUND ELEVATION

## USGS GROUND ELEVATION POINT DATA
## North American Datum 1983 - NAD83
## North American Vertical Datum 1988 - NAVD88

**2013-APS-1276-OE**

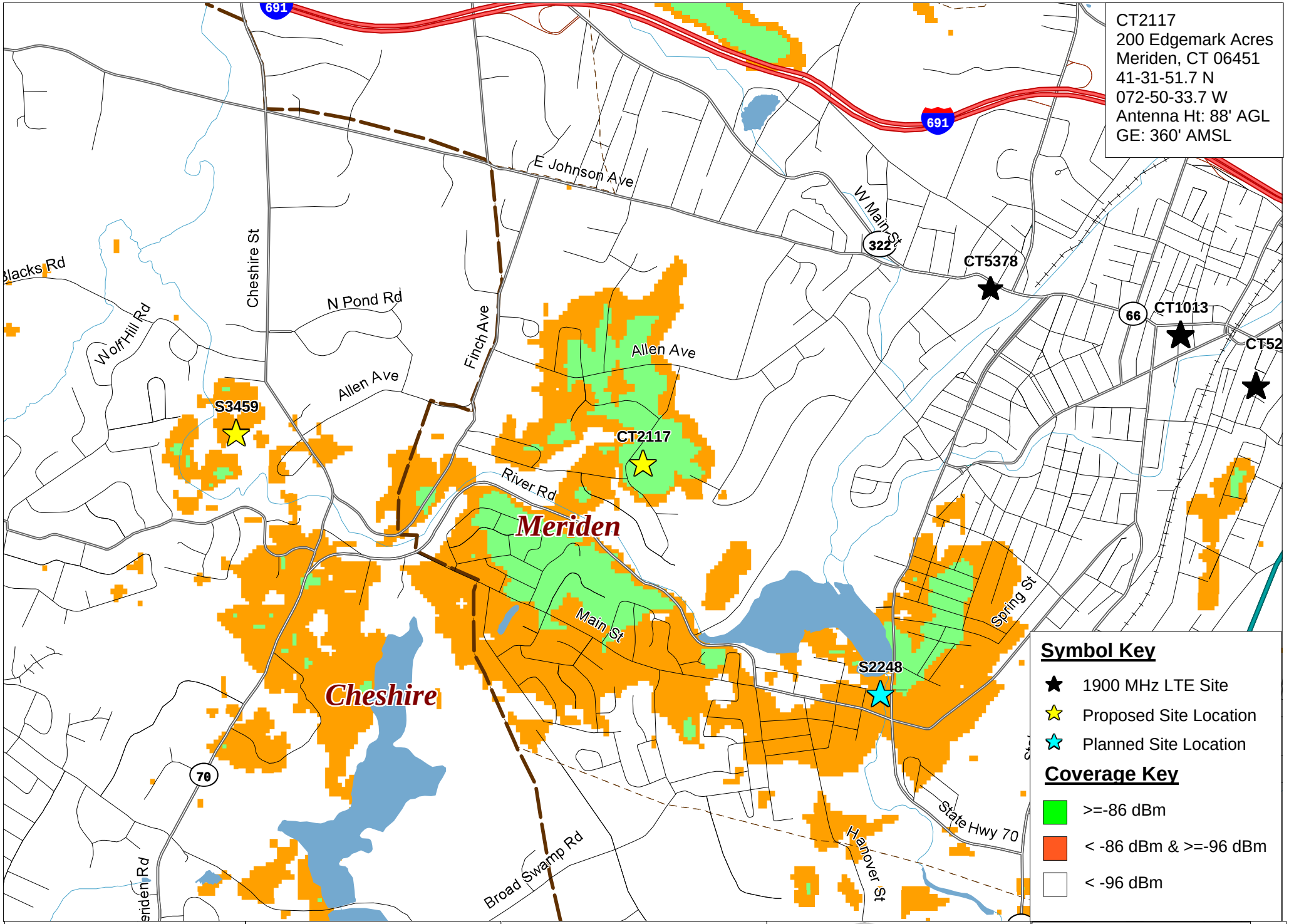
**Latitude:** 41° - 31' - 51.74" N **Decimal Degrees:** 41.5310388888889°
**Longitude:** 72° - 50' - 33.65" W **Decimal Degrees:** -72.8426805555555°

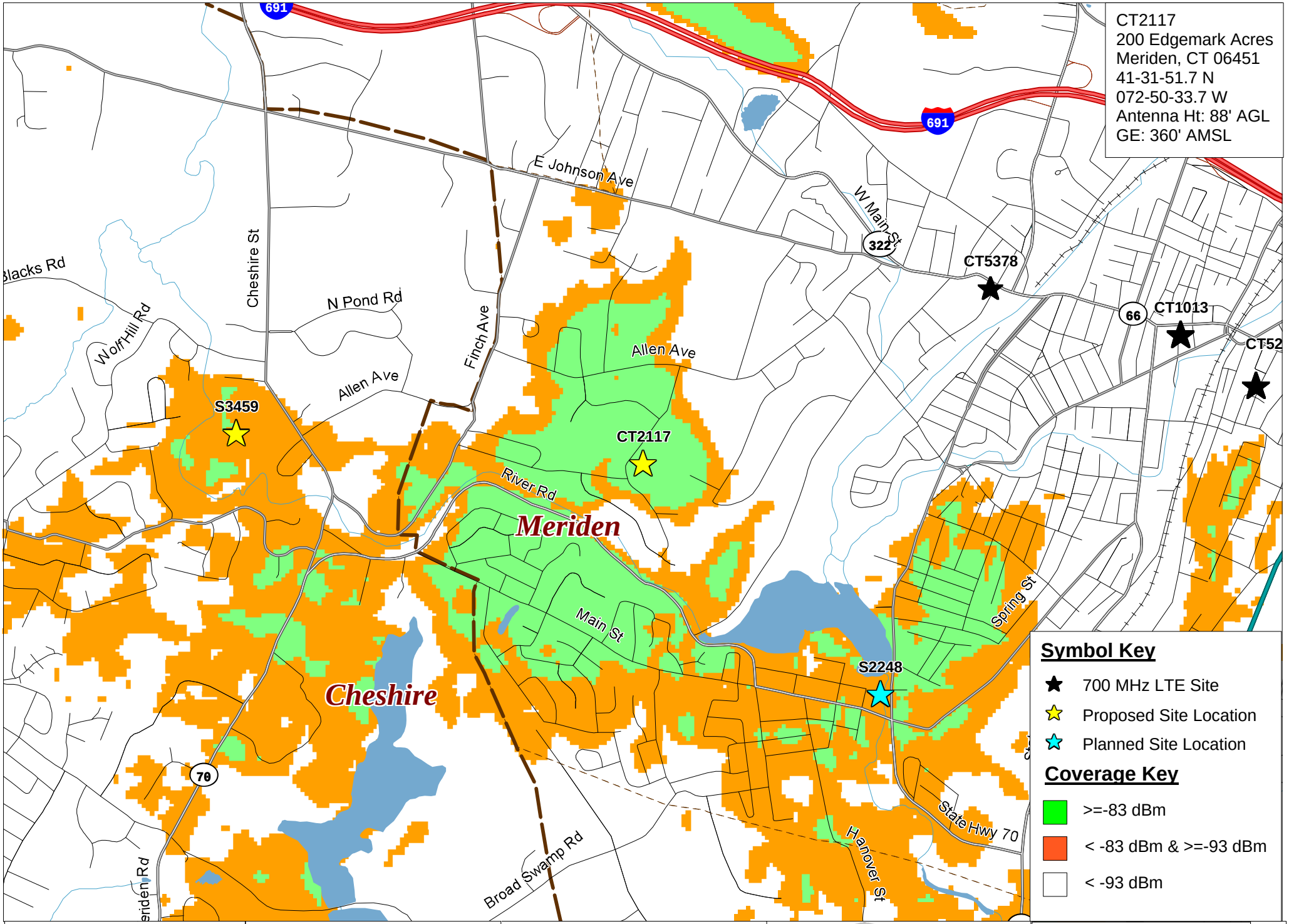
## Ground Elevation: 351.92 feet AMSL

This certifies the above elevation data value for the specified latitude/longitude point was obtained from the United States Geological Survey Seamless Elevation data located at the EROS data center. The elevation value meets vertical accuracy criteria as specified by FAA Order 8260.19C, Appendix 2, Obstacle Accuracy Standards, Codes And Sources, paragraph 101 for Code 'C'. The elevation value for the specified latitude/longitude is accurate to within ±20 feet vertically.

Date Printed: 12-02-2013

# ATTACHMENT F


CT2117
200 Edgemark Acres
Meriden, CT 06451
41-31-51.7 N
072-50-33.7 W
Antenna Ht: 88' AGL
GE: 360' AMSL
691
691
E Johnson Ave
W Main St
322
CT5378
66
CT1013
CT52
Cheshire St
N Pond Rd
Finch Ave
Allen Ave
Allen Ave
Wolf Hill Rd
Blacks Rd
S3459
CT2117
River Rd
Meriden
Main St
Spring St
S2248
Cheshire
70
Broad Swamp Rd
State Hwy 70
Hanover St
Symbol Key
1900 MHz LTE Site
Proposed Site Location
Planned Site Location
Coverage Key
>=-86 dBm
< -86 dBm & >=-96 dBm
< -96 dBm
1900 MHz LTE
Coverage of CT2117
Meriden, CT
200 Edgemark Acres
Meriden, CT 06451
at&t
PREPARED ON
DATE: 11/19/2014
REV
0


CT2117
200 Edgemark Acres
Meriden, CT 06451
41-31-51.7 N
072-50-33.7 W
Antenna Ht: 88' AGL
GE: 360' AMSL
691
691
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Allen Ave
Allen Ave
Blacks Rd
Wolf Hill Rd
S3459
CT2117
River Rd
Meriden
Main St
Spring St
S2248
Cheshire
70
Broad Swamp Rd
Hanover St
State Hwy 70
Symbol Key
700 MHz LTE Site
Proposed Site Location
Planned Site Location
Coverage Key
>=-83 dBm
< -83 dBm & >=-93 dBm
< -93 dBm
700 MHz LTE
Coverage of CT2117
Meriden, CT
200 Edgemark Acres
Meriden, CT 06451
at&t
PREPARED ON
DATE: 11/19/2014
REV
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# ATTACHMENT G

NOTICE

Notice is hereby given, pursuant to Section 16-50j-40(a) of the Regulations of Connecticut State Agencies of a Petition to be filed with the Connecticut Siting Council ("Siting Council") on or after November 25, 2014 by New Cingular Wireless PCS, LLC ("AT&T" or the "Petitioner"). AT&T will seek a declaratory ruling that no certificate of environmental compatibility and public need is required to collocate a wireless telecommunications facility on an existing Connecticut Light & Power ("CL&P") transmission structure located at 200 Edgemark Acres, Meriden, Connecticut (the "Site").

The existing facility, CL&P structure number 783, is located in an existing CL&P right-of-way occupied by the existing transmission lines. It is situated on property located at 200 Edgemark Acres (the "subject parcel), owned by Martorelli Realty Company.

AT&T's proposed facility consists of attaching an approximately 12' tall antenna support structure at the top of the existing 80' tall transmission pole to support up to 12 panel antennas and other equipment at a centerline height of approximately 88' above grade level. A 12' x 24' associated unmanned equipment shelter will be located at grade at the base of the existing transmission pole. The equipment shelter will be completely secured by a 6' tall chain link fence. Provisions for emergency backup power include a 50kW diesel generator to be located inside the proposed equipment shelter. Access to AT&T's facility is proposed from Edgemark Acres via an easement over the existing gravel driveway that currently serves the subject property. A small portion of the beginning of the gravel access driveway is on the subject property, but is not within the CL&P easement. Utility connections to the facility are proposed to extend to Edgemark Acres via underground utility conduits.

The facility is being proposed to allow AT&T to provide service in this area of the State. The Petition will provide details of the facility and explain why Petitioner submits that the proposed co-located wireless facility presents no significant adverse environmental effects. The location, height and other features of the facility are subject to review and potential change under provisions of the Connecticut General Statutes Sections 16-50g et. seq.

Copies of the Petition will be available for review during normal business hours on or after November 26, 2014 at the Connecticut Siting Council:

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

or the offices of the undersigned. All inquiries should be addressed to the Connecticut Siting Council or to the undersigned.

Daniel M. Laub, Esq.
Christopher B. Fisher, Esq.
Cuddy & Feder LLP
445 Hamilton Ave, 14th Floor
White Plains, New York 10601
(914) 761-1300
Attorneys for the Petitioner

## CERTIFICATION OF SERVICE

I hereby certify that on the 24th of November 2014, a copy of the foregoing notice was mailed by certified mail, return receipt requested to each of the abutting properties owners on the accompanying list.

11/24/14
Date

Daniel M. Laub
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, New York 10601

Attorneys for:
New Cingular Wireless PCS, LLC ("AT&T")

ADJACENT PROPERTY OWNERS
200 Edgemark Acres, Meriden, CT

| | |
|---|---|
| Gennaro Martorelli Trustee<br>234 Middle Street<br>Middletown, CT 06457 | Justin W. & Kelly L. Trella<br>268 Edgemark Acres<br>Meriden, CT 06451 |
| Deutsche Bank National Trust Company Tr<br>c/o New Century Equite Loan Tr<br>1761 E St Andrew Pl<br>Santa Ana, CA 92705 | Gloria Martorelli<br>175 Edgemark Acres<br>Meriden, CT 06451 |

## CERTIFICATION OF SERVICE

I hereby certify that on the 24th day of November 2014, notice of the intent to file a petition for declaratory ruling regarding the herein proposed telecommunications Facility in Meriden were sent by certified mail, return receipt requested, to the following:

Dated: 11/24/14

Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, N.Y. 10601
Attorneys for:
New Cingular Wireless PCS LLC ("AT&T")

**State and Regional**

| | |
|---|---|
| The Honorable George Jepsen<br>Attorney General<br>Office of the Attorney General<br>55 Elm Street<br>Hartford, CT 06106 | Department of Economic and<br>Community Development<br>Catherine H. Smith<br>505 Hudson Street<br>Hartford, CT 06106-7106 |
| Department of Public Health<br>Dr. Jewel Mullen, Commissioner<br>410 Capitol Avenue<br>PO Box 340308<br>Hartford, CT 06134 | Department of Transportation<br>James P. Redeker, Commissioner<br>2800 Berlin Turnpike<br>Newington, CT 06111 |
| Council on Environmental Quality<br>Susan D. Merrow, Chair<br>79 Elm Street<br>Hartford, CT 06106 | Department of Agriculture<br>Steven K. Reviczky, Commissioner<br>165 Capitol Avenue<br>Hartford, CT 06106 |
| Office of Policy and Management<br>Benjamin Barnes, Secretary<br>450 Capitol Avenue<br>Hartford, CT 06106-1308 | State Senator-District S13<br>Dante Bartolomeo<br>Legislative Office Building<br>Room 3200<br>Hartford, CT 06106 |

| | |
|---|---|
| Department of Energy & Environmental Protection-Public Utilities Regulatory Authority<br>Chairman Arthur House<br>Ten Franklin Square<br>New Britain, CT 06051 | South Central Regional Council of Governments<br>Carl Amento, Executive Director<br>127 Washington Ave. -4th Floor West<br>North Haven, CT 06473 |
| Connecticut Department of Emergency Services and Public Protection<br>Division of Emergency Management and Homeland Security<br>Dora B. Schriro, Commissioner<br>1111 Country Club Road<br>Middletown, CT 06457 | Department of Economic and Community Development<br>Offices of Culture and Tourism<br>Daniel T. Forrest, State Historic Preservation Officer<br>One Constitution Plaza, 2nd Floor<br>Hartford, CT 06103 |
| Department of Energy & Environmental Protection<br>Rob Klee, Commissioner<br>79 Elm Street<br>Hartford, CT 06106 | State House Representative<br>83rd District<br>Catherine F. Abercrombie<br>Legislative Office Building, Room 2704<br>Hartford, CT 06106 |

**Federal**

| | |
|---|---|
| Federal Communications Commission<br>445 12th Street SW<br>Washington, D.C. 20554 | Federal Aviation Administration<br>800 Independence Avenue, SW<br>Washington, DC 20591 |
| U.S. Congresswoman Elizabeth Esty<br>5th District<br>114 West Main Street<br>Post Office Plaza, LLC<br>New Britain, CT 06051 | U.S. Senator Richard Blumenthal<br>90 State House Square, 10th Floor<br>Hartford, CT 06103 |
| U.S. Senator Christopher Murphy<br>One Constitution Plaza, 7th Floor<br>Hartford, CT 06103 | |

**City of Meriden**

| | |
|---|---|
| Mayor Manuel A. Santos<br>City of Meriden<br>142 East Main Street<br>Meriden, CT 06450 | City of Meriden<br>Planning Commission<br>Enrico Buccilli, Chairman<br>142 East Main Street<br>Meriden, CT 06450 |
| City of Meriden<br>Irene Masse, City Clerk<br>142 East Main Street<br>Meriden, CT 06450 | City of Meriden<br>Inland Wetlands Commission<br>Robert C. Burns, Chairman<br>142 East Main Street<br>Meriden, CT 06450 |
| City of Meriden<br>Dominick Caruso, City Planner<br>142 East Main Street<br>Meriden, CT 06450 | City of Meriden<br>Lawrence Kendzior, City Manager<br>142 East Main Street<br>Meriden, CT 06450 |
| City of Meriden<br>Conservation Commission<br>Maryellen Mordarski, Chairwoman<br>142 East Main Street<br>Meriden, CT 06450 | |

# ATTACHMENT H

**Northeast**
**Utilities System**

56 Prospect Street, Hartford, CT 06103

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

November 21, 2014

Mr. Tim Burks
AT&T Wireless.
500 Enterprise Drive
Rocky Hill, CT 06067

RE: AT&T Antenna Site, CT-2117 200 Edgemark Acres, Meriden CT, CL&P structure 783.

Dear Mr. Burks:

Based on our reviews of the site drawings, the structural and foundation analysis provided by Centek Engineering and, along with a third party review performed by Paul J. Ford we have reviewed for acceptance this modification.

Since there are no outstanding structural issues to resolve at this time please contact Mr. Green (860-665-6933) to resolve any lease issues; once the lease amendment is secured you may contact Mr. John Landry directly (860-665-5425) to begin these arrangements.

Sincerely,

Robert Gray
Transmission Line Engineering

ref: 13305.000 CT2117 Meriden - CD Rev1 14.11.20.pdf
13305.000 - CT2117 Structural Analysis Rev4 14-10-06.pdf

**Northeast Utilities**

107 Selden Street, Berlin, CT 06037

Northeast Utilities
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000
www.nu.com

November 24, 2014

Mr. Tim Burks
Site Acquisition Manager- New England
SAI Communications, Consultant for
AT&T Mobility (a/k/a New Cingular Wireless
500 Enterprise Drive
Rocky Hill, CT 06067

Re: Site Permitting Authorization
200 Edgemark Acres, Meriden, CT
Telecommunications Site

Dear Mr. Burks:

Authorization is hereby given to New Cingular Wireless PCS, LLC (New Cingular), its employees and its duly authorized agents and independent contractors (hereinafter collectively referred to as "New Cingular"), to apply for any and all local municipal, state and federal licenses, permits and approvals, including but not limited to Connecticut Siting Council, building permits, zoning variances, zoning special exceptions, site plan and subdivision approvals, driveway, wetlands and terrain alteration permits, which are or may be necessary or required for New Cingular to construct, operate and maintain a wireless communications system (PCS System), and/or antenna site on the following property over which The Connecticut Light & Power Company (CL&P) has easement rights:

CL&P Structure #783, FAA #10126684
200 Edgemark Acres
Meriden, Connecticut

The foregoing authorization is given subject to the following conditions:

1. This authorization shall be nonexclusive. Nothing herein shall prevent or restrict CL&P from authorizing any other person or entity to apply for any similar licenses, permits or approvals to construct, operate and maintain any other communication system or facility of any type on the property at any time.

2. This authorization shall not obligate CL&P to pay for or reimburse any costs or expenses or to provide any assistance of any kind in connection with any applications, or bind or obligate CL&P to agree or be responsible for any on-site or off-site improvements, development restrictions, impact fees or assessments, capital improvement charges, bonds or other security, or any other fee, assessment, charge or expense imposed or required as a condition of any

license, permit or approval. New Cingular shall be solely and fully responsible for all fees, charges costs and expenses of any kind in connection with any applications. CL&P agrees to reasonably cooperate with New Cingular in signing such applications or other similar documents as may be required in order for New Cingular to apply for any license, permit or approval.

3. This authorization shall not be deemed or construed to grant or transfer to New Cingular any interest in the property, whatsoever, and shall not in any respect obligate or require CL&P to sell, lease or license the Property to New Cingular or otherwise allow New Cingular to use or occupy the property for any purpose, regardless of whether any licenses, permits and approvals applied for by New Cingular for the property are granted. New Cingular understands and acknowledges that any and all applications filed by New Cingular for the property at New Cingular's sole risk and without any enforceable expectation that the property will be made available for New Cingular's use.

4. New Cingular shall be required to supply to CL&P, free of charge and contemporaneous with New Cingular's filing of same, a complete copy of any and all applications, plans, reports and other public filings made by New Cingular with any local, municipal, state or federal governmental or regulatory officer, agency board, bureau, commission or other person or body for any licenses, permits or approvals for the property, and to keep CL&P fully informed on a regular basis of the status of New Cingualr's applications.

5. This authorization shall automatically expire six (6) months after the date of this letter, unless extended in writing by mutual agreement of CL&P and New Cingular.

Very truly yours,

Michael J. Green

Michael J. Green, Senior Real Estate Analyst
T & D ROW & Survey Engineering

**AGREED TO ON BEHALF OF New Cingular Wireless PCS, LLC**

By: _____ Its Agent
Duly Authorized

Date: 11/24/14

Market: Connecticut
Cell Site Number: SR 2117
Cell Site Name: Meriden – Edgemark Acres (NU)
Fixed Asset Number: 10126684

# ADDITIONAL GROUND SPACE LEASE AGREEMENT

THIS ADDITIONAL GROUND SPACE LEASE AGREEMENT ("**Agreement**"), dated as of the latter of the signature dates below (the "**Effective Date**"), is entered into by Martorelli Realty Company, a Connecticut partnership, having a mailing address of 234 Middle Street, Middletown, CT 06457 ("**Landlord**") and New Cingular Wireless PCS, LLC, a Delaware limited liability company, having a mailing address of 575 Morosgo Drive, 13-F West Tower, Atlanta, GA 30324 ("**Tenant**").

## BACKGROUND

Landlord owns or controls that certain plot, parcel or tract of land, as described on **Exhibit 1,** together with all rights and privileges arising in connection therewith, located at 200 Edgemark Acres, Meriden, in the County of New Haven, State of Connecticut (collectively, the "**Property**"). Tenant desires to use a portion of the Property in connection with its federally licensed communications business to provide space for certain of Tenant's equipment necessary or advisable for the operation of its antennas and associated communications fixtures and equipment installed or to be installed on an antenna structure owned by a third party ("**Antenna Landlord**"), which antenna structure is located on the Property or adjacent property. Landlord desires to grant to Tenant the right to use a portion of the Property in accordance with this Agreement.

The parties agree as follows:

1. **LEASE OF PREMISES.** Landlord hereby leases to Tenant a certain portion of the Property containing approximately 702 square feet including the air space above such ground space, as described on attached **Exhibit 1** (the "**Premises**") for the placement of Tenant's Communication Facility and grants such easements as are necessary for installation of all equipment required or advisable to connect Tenant's antennas located on the antenna structure owned by Antenna Landlord with the Communication Facility (as such term is defined in Paragraph 2 below).

2. **PERMITTED USE.** Tenant may use the Premises for the transmission and reception of communications signals and the installation, construction, maintenance, operation, repair, replacement and upgrade of its communications fixtures and related equipment, cables, accessories and improvements, which may include a suitable support structure, equipment shelters or cabinets and fencing and any other items necessary to the successful and secure use of the Premises (collectively, the "**Communication Facility**"), as well as the right to test, survey and review title on the Property; Tenant further has the right but not the obligation to add, modify and/or replace equipment in order to be in compliance with any current or future federal, state or local mandated application, including, but not limited to, emergency 911 communication services, at no additional cost to Tenant or Landlord (collectively, the "**Permitted Use**"). Landlord and Tenant agree that any portion of the Communication Facility that may be conceptually described on **Exhibit 1** will not be deemed to limit Tenant's Permitted Use. If **Exhibit 1** includes drawings of the initial installation of the Communication Facility, Landlord's execution of this Agreement will signify Landlord's approval of **Exhibit 1**. For a period of ninety (90) days following the start of construction, Landlord grants Tenant, its subtenants, licensees and sublicensees, the right to use such portions of Landlord's contiguous, adjoining or surrounding property (the "**Surrounding Property**") as may reasonably be required during construction and installation of the Communication Facility. Tenant has the right to install and operate transmission cables from the equipment shelter or cabinet to the antenna structure which is located on the Property or adjacent property, electric lines from the main feed to the equipment shelter or cabinet and communication lines from the Property's main entry point to the equipment shelter or cabinet, and to make other improvements, alterations, upgrades or additions appropriate for Tenant's Permitted Use, including the right to construct a fence around the Premises and undertake any other appropriate means to secure the Premises at

**IN WITNESS WHEREOF**, the parties have caused this Agreement to be effective as of the last date written below.

**"LANDLORD"**

Martorelli Realty Company

By: _____
Print Name: Gennaro Martorelli
Its: A Partner
Date: 1/8/14

**"TENANT"**

New Cingular Wireless PCS, LLC,
a Delaware limited liability company

By: AT&T Mobility Corporation
Its: Manager

By: _____
Print Name: Kevin L. Mason
Its: Area Manager – Construction & Engineering
Site Acquisition for the New England Market
Date: 1-14-2014

**[ACKNOWLEDGMENTS APPEAR ON THE NEXT PAGE]**

## TENANT ACKNOWLEDGMENT

State of Massachusetts

County of Middlesex

On this the 14 day of January, 2014 before me Kevin L. Mason the undersigned officer, personally appeared Kevin L. Mason who acknowledged himself to be the Area Manager-Construction & Engineering, Site Acquisition for the New England Market of AT&T Mobility Corporation, manager of New Cingular Wireless PCS, LLC, a (member managed or manager managed) limited liability company, and that he, as such Area Manager, being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the limited liability company by himself as Area Manager-Construction & Engineering, Site Acquisition for the New England Market.

In witness whereof I hereunto set my hand.

KATHLEEN E BURNS
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
November 13, 2020

Notary Public

Print Name: Kathleen E Burns

My Commission Expires: 11/13/20

## LANDLORD ACKNOWLEDGMENT

State of CT

County of Middlesex

On this the 8th day of January 2014 before me, Andrea P. Atkins the undersigned officer, personally appeared Anthony Martorelli who acknowledged himself to be the partner of Martorelli Realty Company, a partnership, and that he, as such partner, being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the partnership by himself as a partner.

In witness whereof I hereunto set my hand.

Andrea P. Atkins
Notary Public

Print Name: _____

My Commission Expires: 6/30/14